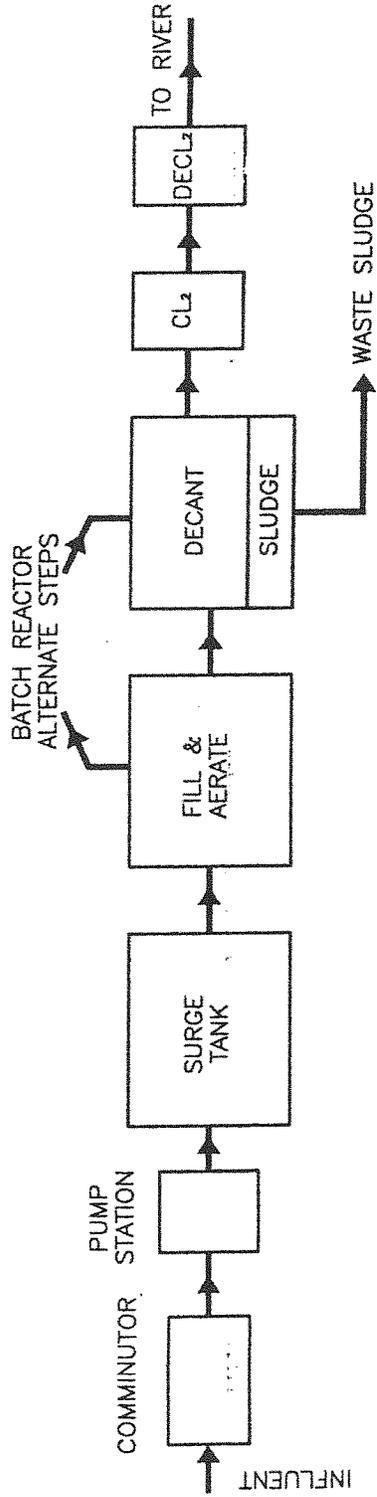


ATTACHMENT A
Flow Diagram

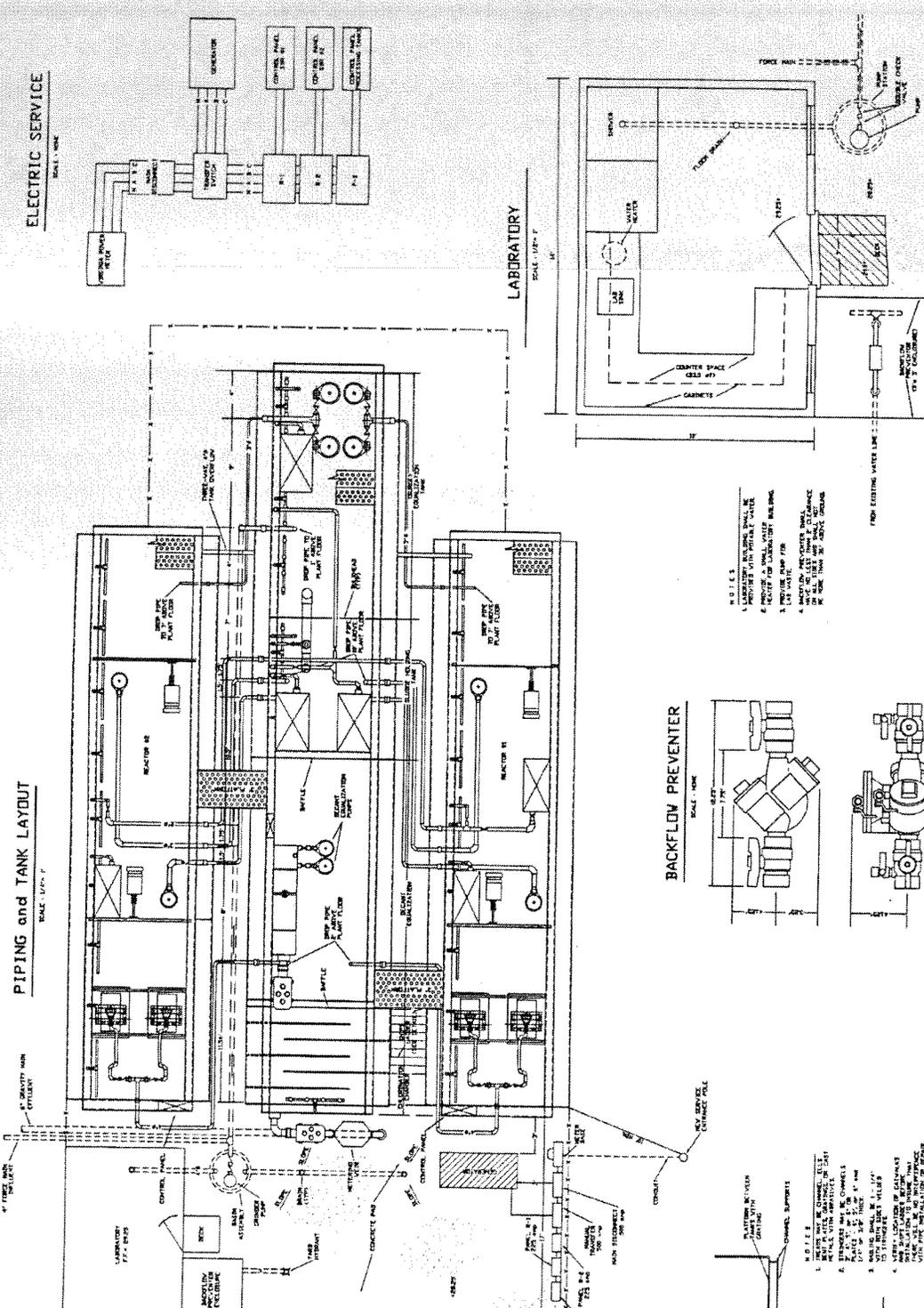
FLOW DIAGRAM



TREATMENT PROCESS

NARRATIVE

Comminutor, pump station, influent equalization basin, duplex sequencing batch reactors, chlorine contact tank with tablet chlorination and dechlorination, effluent flow meter and aerobic digestion. The outfall is equipped with a multi-port diffuser.



STP
PLANT
LAYOUT

8
of
15



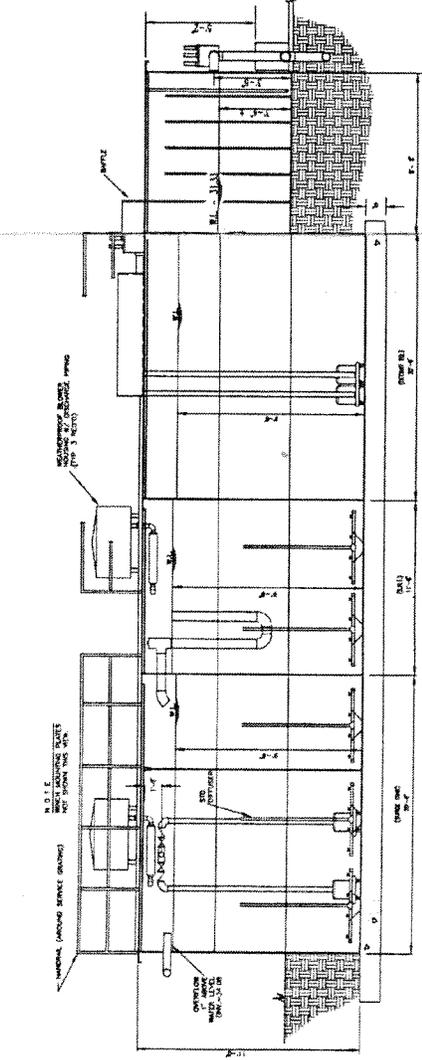
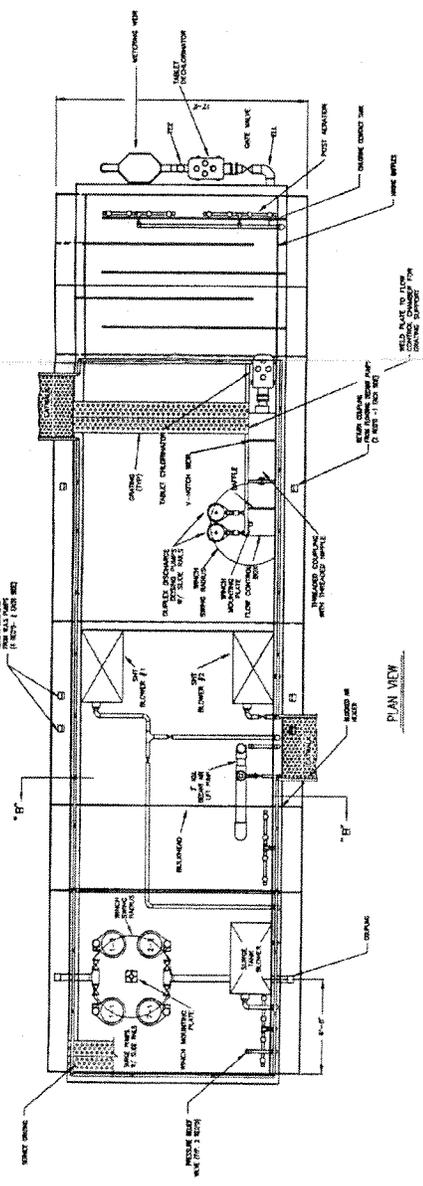
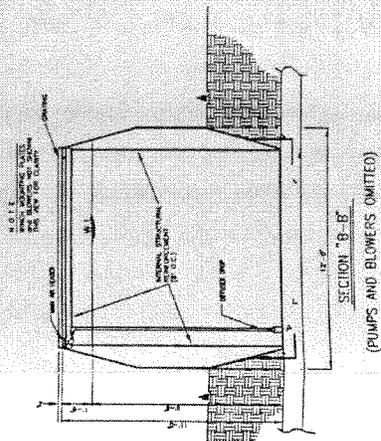
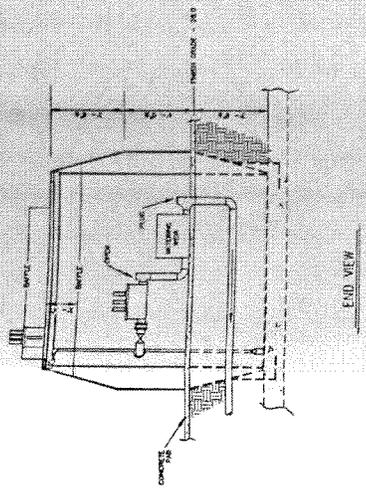
DATE	10-10-69
SCALE	AS SHOWN
PROJECT NO.	9126
CLIENT	THE TIDES INN
LOCATION	WASTE WATER TREATMENT SYSTEM
DESIGNED BY	JAMES D. CASIE
CHECKED BY	JAMES D. CASIE
APPROVED BY	JAMES D. CASIE

THE TIDES INN
WASTE WATER TREATMENT SYSTEM
LEXINGTON, VIRGINIA

CASIE ENGINEERING
A PROFESSIONAL CORPORATION
CONSULTING ENGINEERS - LAND PLANNING - MARINE DESIGN
CORPORATE OFFICE: 1000 W. MAIN ST., SUITE 100, RICHMOND, VA 23220
PHONE: (804) 781-1111

REVISIONS	
NO.	DESCRIPTION

THIS DRAWING IS THE PROPERTY OF CASIE ENGINEERING, P.C. AND IS NOT TO BE REPRODUCED OR USED FOR ANY PROJECT IN WHOLE OR IN PART WITHOUT EXPRESS WRITTEN PERMISSION.
J. N. I. 9216



11
of
15
PROCESsing
SECTION



DATE	03-10-93
NO.	9216
PROJECT	WASTE WATER TREATMENT SYSTEM
CLIENT	THE TIDES INN
SCALE	AS SHOWN
PROJECT	9216
DATE	03-10-93

THE TIDES INN
WASTE WATER TREATMENT SYSTEM
IRVINGTON, VIRGINIA

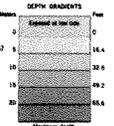
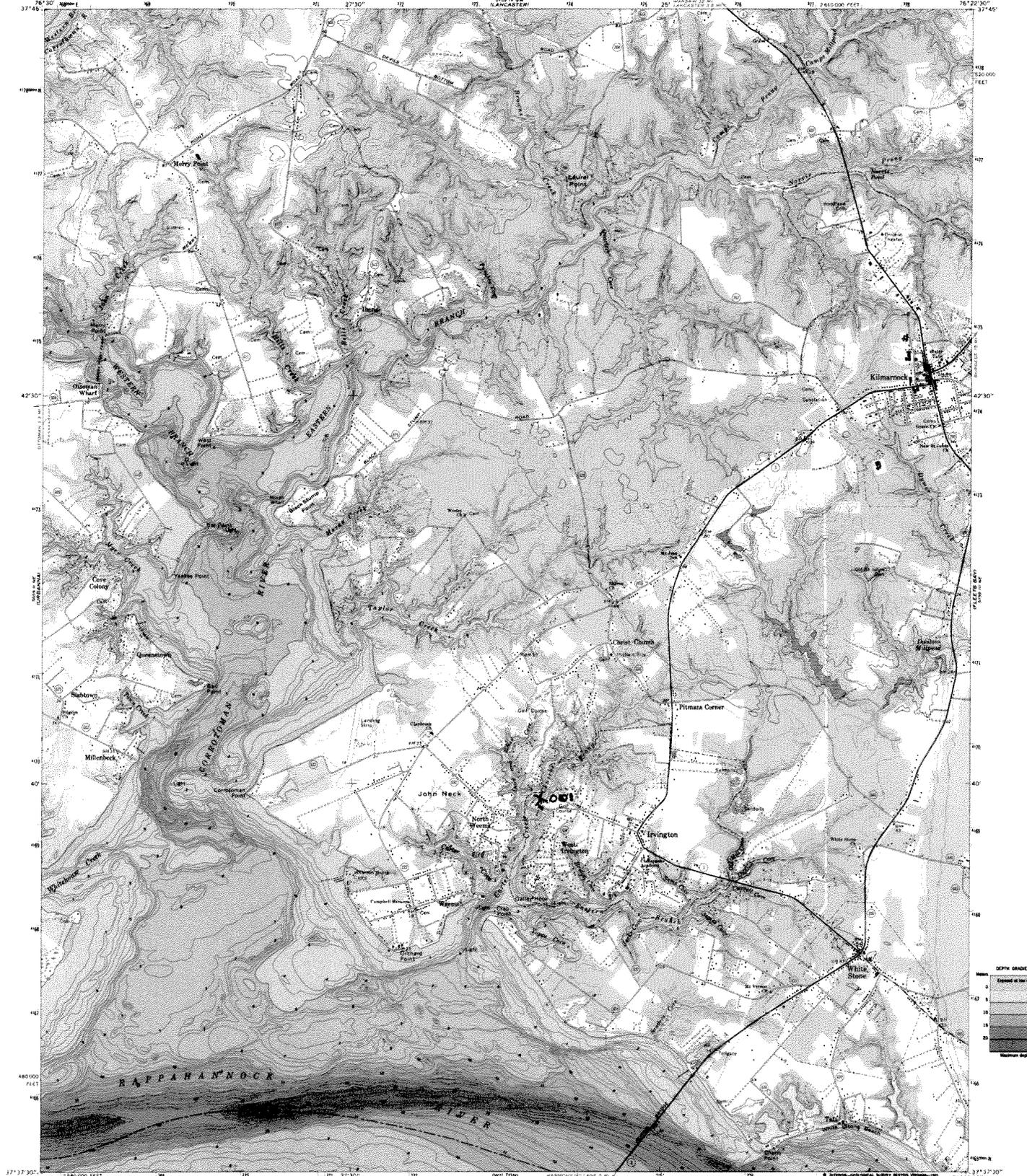
CASKIE ENGINEERING
A PROFESSIONAL CORPORATION
GENERAL ENGINEERING - LAND PLANNING - SURVEY DESIGN
1001 W. MARKET ST., SUITE 200, RICHMOND, VA 23297

REVISIONS

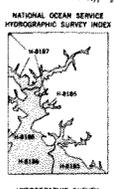
NO.	DATE	DESCRIPTION

ATTACHMENT B

Site Map



Produced by the United States Geological Survey and the National Ocean Service
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1964.
Bathymetry compiled by the National Ocean Service from sub-coastal bathymetric surveys. This information is not intended for navigation purposes.
Mean low water (solid) line and mean high water (heavy solid) line compiled by NOS from bathymetric and photographic information. Apparent shoreline (outer edge of vegetation) shown by light solid line.
Tropic projection. 1927 North American Datum.
1:50,000-foot grid based on Virginia coordinate system, south zone.
1000-meter Universal Transverse Mercator grid ticks, zone 18.
North arrow (center of map) based on 1983 datum. Other corner ticks.
The values of the north reference line are 77 and 78 for 7.5-minute quadrangles and 77 and 78 for 15-minute quadrangles.
Photostereos from 1963; 1964; no major culture or change since 1963. Some features and names revised 1982.
Revisions shown in purple completed in cooperation with Commonwealth of Virginia agencies from aerial photographs taken 1981 and other source data. This information not for navigation. Map sheet 1982.



Sheet	Year	Scale	Series
18185	1964	1:50,000	18-06
18187	1964	1:50,000	18-07

SCALE 1:24,000
CONTOUR INTERVAL 10 FEET
BATHYMETRIC CONTOUR INTERVAL 1 METER WITH SUPPLEMENTARY 0.5 METER CONTOURS-DRAWN AT MEAN LOW WATER
THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIABLE
DOTTED LINES REPRESENT 3 FOOT CONTOURS
NATIONAL OCEAN SERVICE
BATHYMETRIC SURVEY DATA COMPILED WITH INTERNATIONAL HYDROGRAPHIC BUREAU STAMPS
FOR SALE BY U.S. GEOLOGICAL SURVEY, GEORGETOWN, MARYLAND 20882
AND VIRGINIA DIVISION OF MINERAL RESOURCES, CHARLOTTESVILLE, VIRGINIA 22903
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION
Primary highway, all weather. Light-duty road, all weather.
Hard surface. Improved surface.
Secondary highway, all weather. Unimproved road, fair or dry weather.
Hard surface. weather.
State Route

IRVINGTON, VA.
37°14'18.024
1969
PHOTO REVISION 1975
BATHYMETRY ADDED 1986
MINOR REVISION 1982
GMA 5339 10 NW - SERIES 9334

ATTACHMENT C

Flow Frequency Memorandum and Ambient Data

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office
4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status
Tides Utilities South WWTP – VA0029351

TO: Laura Galli

FROM: Jennifer Palmore, P.G.

DATE: December 5, 2014

COPIES: File

The Tides Utilities South Wastewater Treatment Plant discharges to Carter Creek near West Irvington, in Lancaster County. The outfall is located at rivermile 3-CTR001.14. Flow frequencies have been requested for use in developing effluent limitations for the VPDES permit.

Carter Creek is tidally influenced at the discharge point. Flow frequencies cannot be determined for tidal streams. The previously determined dilution ratio of 32:1 for a multi-port diffuser should be used (Dale Phillips, 5/11/1994).

During the 2012 305(b)/303(d) Integrated Water Quality Assessment, Carter Creek was assessed as a Category 4A water (“Impaired or threatened for one or more designated uses but does not require a TMDL because the TMDL for specific pollutant(s) is complete and US EPA approved.”) The mesohaline portion of the Rappahannock River estuary, which includes Carter Creek, is impaired for dissolved oxygen due to EPA policy based on the previous failure of the Chesapeake Bay 30-day open water summer dissolved oxygen criteria; the applicable fact sheet is attached. Carter Creek was fully supporting of the Recreation, Fish Consumption and Wildlife Uses. The Shellfish Use is not applicable in this segment because it is within a VDH Prohibited Zone; therefore the Use is considered to be removed.

Water quality data from monitoring station 3-CTR000.76 is attached. The station is located on Carter Creek at the pier at the end of Crockett’s Lane, which is approximately 0.4 mile downstream of the Tides Inn discharge.

Although Carter Creek is considered impaired of the Aquatic Life Use, the impairment is due to segment-wide low dissolved oxygen and is not necessarily indicative of the local water quality. Review of the data from station 3-CTR000.76 indicates only 2 dissolved oxygen values were below the 30-day mean water quality standard. In addition, both values were above the instantaneous and 7-day mean water quality standards. Due to this, Carter Creek should be considered a Tier 2 water.

The Tides Inn was addressed in the Chesapeake Bay TMDL, which was approved by the EPA on 12/29/2010. The TMDL allocates loads for total nitrogen, total phosphorus, and total suspended solids to protect the dissolved oxygen and SAV criteria in the Chesapeake Bay and its tidal tributaries. The discharge was included in the aggregated loads for non-significant wastewater dischargers in the mesohaline Rappahannock River estuary (RPPMH). The nutrient allocations are administered through the Watershed Nutrient General Permit; the TSS allocations are considered aggregated and facilities with technology-based TSS limits are considered to be in conformance with the TMDL.

The discharge is located within the study watershed for the Carter Creek Shellfish TMDL, which was approved by the EPA on 9/20/2007 and by the SWCB on 7/31/2008. However, harvest is prohibited in the area around the discharge; therefore, the facility is not considered to directly impact shellfish waters and was not addressed in the TMDL.

If you have any questions concerning this analysis, please let me know.

2012 Fact Sheets for 303(d) Waters

RIVER BASIN:	Rappahannock River Basin	HYDROLOGIC UNIT:	02080104
STREAM NAME:	Rappahannock River		
TMDL ID:	RPPMH-DO-BAY	2012 IMPAIRED AREA ID:	CB-RPPMH
ASSESSMENT CATEGORY:	4A/3B	TMDL DUE DATE:	2010
IMPAIRED SIZE:	123.53 - Sq. Mi.	Watershed:	VAP-E22E
INITIAL LISTING:	1998		
UPSTREAM LIMIT:	Mesohaline boundary		
DOWNSTREAM LIMIT:	Mouth at Chesapeake Bay		

The mesohaline Rappahannock River and tidal tributaries.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Aquatic Life Use - Not Supporting, Open Water Subuse - Insufficient Information, Deep Water Use - Not Supporting, Deep Channel Use - Not Supporting

IMPAIRMENT: Dissolved Oxygen

The mainstem of the Rappahannock River from Myrtle Swamp to its mouth was originally listed in 1998 by DEQ due to dissolved oxygen exceedances and nutrient overenrichment. The EPA extended the segment upstream to the confluence with Totuskey Creek. In the 2004 cycle dissolved oxygen exceedances were noted in deep water and deep channel stations downstream of the confluence with Lancaster Creek (Morattico), which is further downstream.

The new Chesapeake Bay Water Quality Standards were implemented during the 2006 cycle. The mesohaline portion of the Rappahannock previously failed the Open Water Subuse's summer 30-day mean dissolved oxygen criteria, however during the 2012 cycle the segment meets both the summer and rest-of-year criteria. Due to EPA policy, the segment must remain impaired for DO until all criteria can be assessed.

Applicable areas fail the Deep Water 30-day mean dissolved oxygen criteria. During the 2008 cycle, the Deep Channel Subuse's instantaneous minimum dissolved oxygen criteria was violated, however the segment met the use during the 2010 cycle and was delisted; it is re-impaired during the 2012 cycle. There is insufficient data to assess the other dissolved oxygen criteria. The Chesapeake Bay TMDL was approved by the EPA on 12/29/2010, therefore RPPMH is considered Category 4A.

The mesohaline portion of the Rappahannock River does not meet the Shallow Water Subuse's submerged aquatic vegetation acreage standards. However, RPPMH had acceptable water clarity acreage during the 2010 cycle and the segment was delisted; it remains fully supporting in the 2012 cycle (Category 2C).

The Chesapeake Bay TMDL was approved by the EPA on 12/29/2010, therefore RPPMH is considered Category 4A.

IMPAIRMENT SOURCE: Point Source, Nonpoint Source

The Chesapeake Bay TMDL allocated total nitrogen, total phosphorus, and total suspended solids to point and nonpoint sources throughout the watershed.

RECOMMENDATION: Implementation

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Fdt Do Optical	Salinity	Secchi Depth
3-CTR000.76	7/25/2000	S	0.3	24.81	7.62	5.91			13.5	
3-CTR000.76	7/25/2000	S	1	24.79	7.61	5.81			13.5	0.9
3-CTR000.76	7/25/2000	B	1.5	24.81	7.59	5.76			13.5	
3-CTR000.76	8/30/2000	S	0.3	26.11	8.02	7.08			14	
3-CTR000.76	8/30/2000	S	1	25.98	7.97	6.29			14.2	1
3-CTR000.76	8/30/2000	B	1.7	25.88	7.84	4.9			14.4	
3-CTR000.76	9/11/2000	S	0.3	25.89	8.01	8.14			14.1	
3-CTR000.76	9/11/2000	S	1	25.42	7.87	6.88			14.1	1.1
3-CTR000.76	9/11/2000	B	1.6	25.16	7.81	5.99			14.3	
3-CTR000.76	10/25/2000	S	0.3	17.73	7.96	7.62			15.79	
3-CTR000.76	10/25/2000	S	1	17.73	7.98	7.58			15.85	
3-CTR000.76	10/25/2000	B	1.8	17.84	8	7.58			15.92	
3-CTR000.76	8/28/2001	S	0.3	28.95	7.67	6.77			16.2	
3-CTR000.76	10/24/2001	S	0.3	19.4	7.85	8.89			18.6	
3-CTR000.76	12/6/2001	S	0.3	14.05	7.36	9.01			20.5	
3-CTR000.76	2/7/2002	S	0.3	6.21	7.38	9.45			19.2	
3-CTR000.76	2/26/2002	S	0.3	9.29	7.97	10.31			19.86	
3-CTR000.76	3/5/2002	S	0.3	7.54	7.56	10.33			20.3	
3-CTR000.76	4/30/2002	S	0.3	19.24	7.94	8.18			19.3	
3-CTR000.76	6/5/2002	S	0.3	27.93	7.86	6.68			18.49	
3-CTR000.76	7/31/2002	S	0.3	31.22	8.03	7.71			18.02	
3-CTR000.76	9/4/2002	S	0.3	26.37	8.11	8.84			20.02	
3-CTR000.76	11/21/2002	S	0.3	12.27	8.1	10.59			20.07	
3-CTR000.76	1/14/2003	S	0.3	4.37	8.12	12.63			15.26	
3-CTR000.76	3/13/2003	S	0.3	9.24	8.51	12.98	12.43		11.61	
3-CTR000.76	5/14/2003	S	0.3	23.04	9.03	13.74			9.96	
3-CTR000.76	2/22/2007	S	0.3	6.9	7.4	12.1			12.2	
3-CTR000.76	4/9/2007	S	0.3	13	8.1	10.3			11.3	
3-CTR000.76	6/5/2007	S	0.3	25.7	7.9	8.3			12.3	
3-CTR000.76	8/23/2007	S	0.3	26.7	7.8	6.5			17	
3-CTR000.76	10/30/2007	S	0.3	17.9	7.7	7.5			18.6	
3-CTR000.76	12/20/2007	S	0.3	6.7	7.6	10.3			19.9	
3-CTR000.76	2/27/2008	S	0.3	8.2	7.9	4.1			17.5	
3-CTR000.76	2/29/2008	S	0.3	7.3	7.1	10.7			16.8	
3-CTR000.76	4/23/2008	S	0.3	18.5	7.8	8.3			13.9	
3-CTR000.76	6/23/2008	S	0.3	28.1	7.9	7.2			11.2	
3-CTR000.76	8/6/2008	S	0.3	29.9	8.2	7.1			14.7	
3-CTR000.76	10/9/2008	S	0.3	20.5	7.9	7.4			17.3	
3-CTR000.76	12/17/2008	S	0.3	8.2	7.8	10.2			18.8	
3-CTR000.76	1/15/2013	S	0.3	8.04	7.81	14.21			16.89	
3-CTR000.76	2/21/2013	S	0.3	5.78	8.25	11.6			15.09	
3-CTR000.76	3/26/2013	S	0.3	8.18	8.37	11.96			13.17	
3-CTR000.76	4/17/2013	S	0.3	17.88	8.08	8.45			13.47	
3-CTR000.76	5/29/2013	S	0.3	22.93	7.45	7.41			15.18	
3-CTR000.76	6/25/2013	S	0.3	28.15	7.58	6.61			15.16	
3-CTR000.76	7/23/2013	S	0.3	30.56	8.08	7.06			15.41	
3-CTR000.76	8/8/2013	S	0.3	27.11	7.73	6.36			18.63	
3-CTR000.76	9/5/2013	S	0.3	27.74	7.95	7.73			17.17	
3-CTR000.76	10/17/2013	S	0.3	21.37	7.56			8.51	18.08	
3-CTR000.76	11/7/2013	S	0.3	15.83	7.41	7.5			18.18	
3-CTR000.76	12/12/2013	S	0.3	6.64	7.61	11.07			17.66	
90th Percentile				28.1	8.1					
10th Percentile				6.9	7.5					
Average									16.0	

ATTACHMENT D

Site Inspection and Site Visit Reports



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE

4949-A Cox Road, Glen Allen, Virginia 23060

(804) 527-5020 Fax (804) 527-5106

www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Michael P. Murphy
Regional Director

July 5, 2012

Gordon Slatford, General Manager
The Tides Utilities LLC
480 King Carter Dr.
Irvington, VA 22480

RE: The Tides Utilities, LLC North VPDES Permit Number VA0029343 and Tides Inn Utilities, LLC South VPDES Permit Number VA0029351-Inspection Reports

Dear Mr. Slatford:

Enclosed is your copy of the Wastewater Facility Inspection Reports and the Laboratory Inspection Reports conducted at The Tides Inn (South) and The Tides Lodge (North) on June 6, 2012. The facilities appear to be in good working order and well maintained. No compliance recommendations were noted at this time. You need not respond to the general recommendations as they are submitted only for your consideration.

Please pass on our appreciation to Mr. Hall for the time and courtesy extended to us during the inspection. Mr. Hall is a very knowledgeable operator and should be commended for his excellent record keeping. If you have any questions regarding these reports, please do not hesitate to contact me at (804) 527-5064.

Sincerely,

A handwritten signature in cursive script that reads 'Heather Horne Deihls'.

Heather Horne Deihls
Environmental Inspector

Attachments

Virginia Department of Environmental Quality

WASTEWATER FACILITY INSPECTION REPORT

FACILITY NAME: The Tides Utilities, LLC South 480 King Carter Drive Irvington, VA 22480		INSPECTION DATE: June 6, 2012	
PERMIT No.: VA0029351		INSPECTOR: Heather A. Horne and Meredith R. Williams hab 6-29-12	
TYPE OF FACILITY: <input checked="" type="checkbox"/> Municipal <input checked="" type="checkbox"/> Small Minor <input type="checkbox"/> Industrial <input type="checkbox"/> Federal		REPORT DATE: June 29, 2012	
		TIME OF INSPECTION: 1014 Arrival 1208 Departure	
		TOTAL TIME SPENT (including prep & travel) 24 hours	
PHOTOGRAPHS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		UNANNOUNCED INSPECTION? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
REVIEWED BY / Date: <i>KW 7/2/12 MLW 7/3/12</i>			
PRESENT DURING INSPECTION: <u>Allen Hall, Operator</u>			

TECHNICAL INSPECTION

1. Has there been any new construction? • If so, were plans and specifications approved? <u>Comments:</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Is the Operations and Maintenance Manual approved and up-to-date? <u>Comments: The O&M Manual approved 3/23/95 was present onsite. Certified current on 5/13/10.</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3. Are the Permit and/or Operation and Maintenance Manual specified licensed operator being met? <u>Comments: One Class III Operator; One trainee is preparing to sit for Class IV license</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4. Are the Permit and/or Operation and Maintenance Manual specified operator staffing requirements being met? <u>Comments: The plant is staffed 7 days/week from 0530-1400.</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Is there an established and adequate program for training personnel? <u>Comments: Sacramento training; DEQ operator training</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6. Are preventive maintenance task schedules being met? <u>Comments: Record daily checks</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7. Does the plant experience any organic or hydraulic overloading? <u>Comments:</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
8. Has there been any bypassing or overflows since the last inspection? <u>Comments:</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
9. Is the standby generator (including power transfer switch) operational and exercised regularly? <u>Comments: A dedicated generator is present at the two pump stations. Both are checked daily</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
10. Is the plant alarm system operational and tested regularly? <u>Comments: Alarm systems are maintained for the WWTP and the pump stations. Autodialer for plant calls front desk and then operator.</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
11. When was the backflow prevention device last tested (annually required)? July 18, 2011; the operator is certified to test.	

VA DEQ Wastewater Facility Inspection Report

Permit #

VA0029351

INSPECTION OVERVIEW AND CONDITION OF TREATMENT UNITS

Wastewater Pump Stations: The Influent/Main Pump Station receives wastewater from most buildings, and flow from the Commodore, Dock House, and Garden House Pump Stations. These three small stations are all equipped with two pumps (alternate automatically) and local alarm signals to indicate a high liquid level condition. None have back up power for the alarm system. Should the pumps fail at the Influent Pump Station, wastewater would back flow to the aeration basin of the former WWTP, where it can be returned to the new WWTP. The Lab Building Pump Station is float operated. The alarm system monitors for high water levels and has local audible and visual alarms. All stations are checked daily by maintenance staff. A dedicated generator is available if needed to pump from the main pump station to the WWTP. Pump stations are pumped out annually.

Bar Screen/Comminutor: The bar screen and comminutor (located at the old WWTP near Outfall 001) is checked daily. If screenings were to cause a backup, the high level alarm in the pump station would signal. The comminutor operates continuously and was functional at the time of inspection. The bar screen was present and functional, but not in use. A metal gate must be manually raised in order to divert flow to the bar screen.

Grit Removal: Grit is removed from the main pump station on an as needed basis (generally pumped when sludge holding tanks are pumped). A grease trap is installed just off the kitchen (precedes Influent Pump Station). The grease trap is pumped out approximately once every three months.

Flow Equalization: The flow rate to the activated sludge package plant is controlled in-line. Excess flow is diverted by valve to the equalization basin (0.015 MG capacity). One of three blowers provides air (rotated with sludge holding tank and spare blower.)

Sequencing Batch Reactors: Two SBR units are present; each with a 0.038 MG capacity. The volume of discharge is 12,000 gallons. There are two decant pumps and two waste pumps in each SBR unit. The plant is operated for ammonia, including BOD, control. Cycles are controlled by a microprocessor (PLC). The PLC has battery back-up to prevent cycle resetting itself after power failure and when emergency generator kicks in. High level (float activated), blower failure, and pump failure has audible alarms and an autodialer notifies Mr. Hall at home and the front desk. Three 15 horsepower blowers provide aeration for the SBR by time clock. Blowers are manually alternated weekly. The aeration schedule is set to maintain approximately 1 mg/l dissolved oxygen concentration. Each batch is treated in the following cycles: fill - mix cycle (two mechanical mixers), react cycle, settle cycle, and decant cycle. The timers are set for 4 hours of diffuser aeration and 1 hour of settling. Approximately three batches are run per day. The system was in good condition and fully operational. Decant water flows to a decant processing station (15,000 gallon holding tank) prior to being pumped to chlorine contact tank via a flow equalization metering unit. Three minutes from each batch goes to the sludge holding tank based on settleability (usually 300-400 mg/L). Settleability test is performed daily. Microbiological exam is conducted weekly (typically stalked ciliates and free swimmers; if rotifiers present then wasting of sludge is planned). Unit 1 was filling at the time of inspection and Unit 2 was reacting. All pumps were fully operational, and aeration/mixing appeared to be adequate.

Activated Sludge Aeration Basin: The basin is operated on a 15 minute on/30 minutes off aeration cycle. The blower is equipped with an alarm. The tank is pumped and hauled on an as needed basis. Supernatant is returned by airlift to the surge tank and the rate is manually controlled.

VA DEQ Wastewater Facility Inspection Report

Permit #

VA0029351

INSPECTION OVERVIEW AND CONDITION OF TREATMENT UNITS

Chlorination: Two chlorine tubes were in use. The facility uses Sanuril 115 Calcium hypochlorite tablets. The contact tank is equipped with diffused post aeration, but it is not used often. The water in the tank was fairly clear. The CCT is pumped out as needed when leaves etc. get in the tank. The CCT was last pumped in the early spring.

Dechlorination: Four tubes of sodium sulfite tablets were in use.

Flow Measurement: The ultrasonic sensor w/90° v-notch weir equipped with display, totalizer and chart was calibrated on 8/18/11. At the time of inspection, there was no discharge because the plant was between batches. Therefore, the meter read 0 gpm.

Effluent/Plant Outfall: The outfall is located in the vicinity of the old WWTP. Discharge flows via gravity to the outfall and is discharged via submerged pipe with three diffusers. The receiving stream appeared normal.

Old Polishing Pond: The old polishing pond onsite (near the comminutor and outfall) still holds water and functions as a fire suppression water pond.

VA DEQ Wastewater Facility Inspection Report

Permit #	VA0029351
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EFFLUENT FIELD DATA: Collected by Allen Hall at 6 a.m. on 6/16/12

Flow 20,030 gal/d	Dissolved Oxygen 7.82 mg/L	TRC (Contact Tank) 1.0 mg/L
pH 8.45 S.U.	Temperature 25.1 °C	TRC (Final Effluent) <QL mg/L
Was a Sampling Inspection conducted? <input type="checkbox"/> Yes (see Sampling Inspection Report) <input checked="" type="checkbox"/> No		

CONDITION OF OUTFALL AND EFFLUENT CHARACTERISTICS:

1. Type of outfall: <input type="checkbox"/> Shore based <input checked="" type="checkbox"/> Submerged	Diffuser? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2. Are the outfall and supporting structures in good condition?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3. Final Effluent (evidence of following problems):	<input type="checkbox"/> Sludge bar <input type="checkbox"/> Grease <input type="checkbox"/> Turbid effluent <input type="checkbox"/> Visible foam <input type="checkbox"/> Unusual color <input type="checkbox"/> Oil sheen
4. Is there a visible effluent plume in the receiving stream?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5. Receiving stream:	<input checked="" type="checkbox"/> No observed problems <input type="checkbox"/> Indication of problems (explain below)
<u>Comments: No discharge at the time of inspection. Outfall 001 discharges via submerged pipe to Ashburn Cove of Carter's Creek - there were no unusual conditions observed. It was high tide at the time of inspection.</u>	

REQUIRED CORRECTIVE ACTIONS:

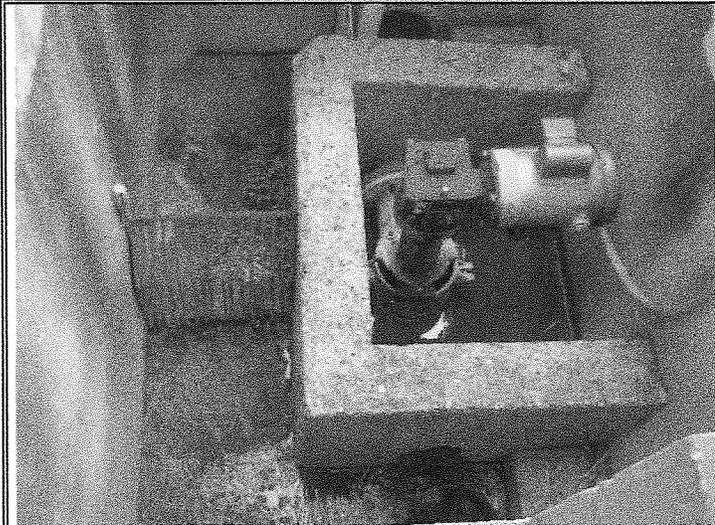
1. None.

NOTES and COMMENTS:

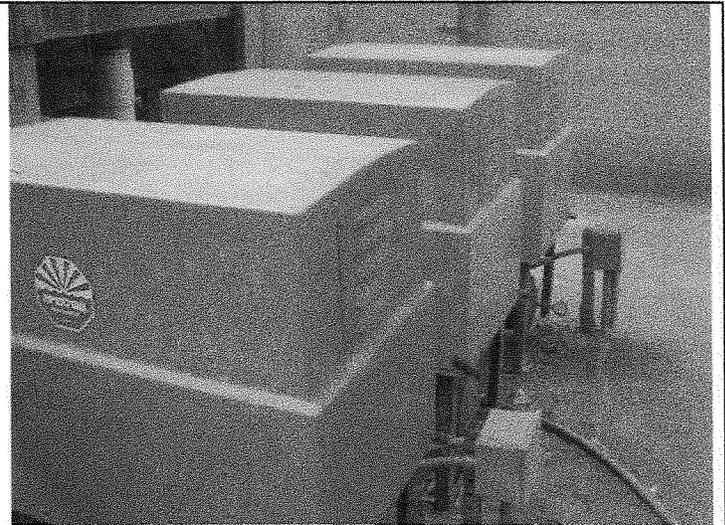
1. This facility maintains excellent operation and maintenance records. All daily checks are recorded. 2. The facility is very conscientious of corrosion prevention. Units and walking structures are regularly sanded, painted, and repaired to ensure structural integrity and safety.
--

VA DEQ Wastewater Facility Inspection Report

Tides North WWTP: VA00293 51
Digital Photographs Taken: 6/6/12



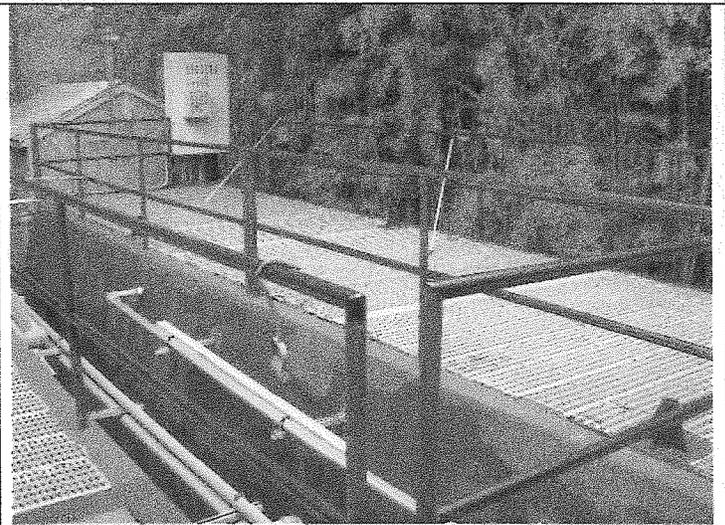
Photograph 1: Comminutor and bar screen



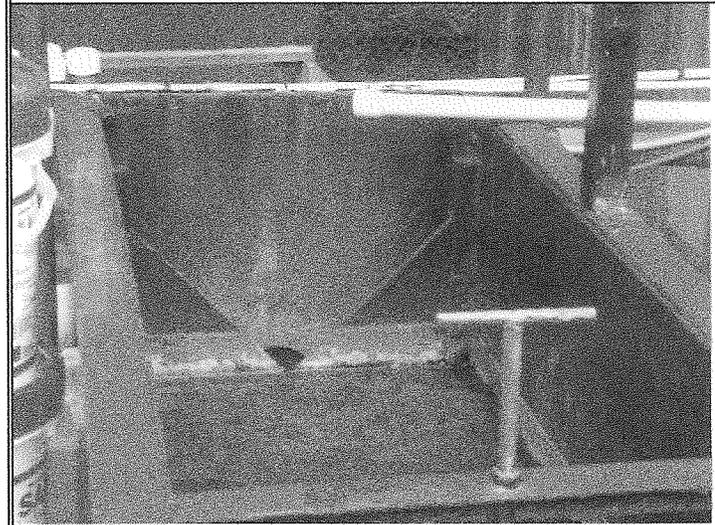
Photograph 2: Blowers



Photograph 3: SBR #1



Photograph 4: SBR #2



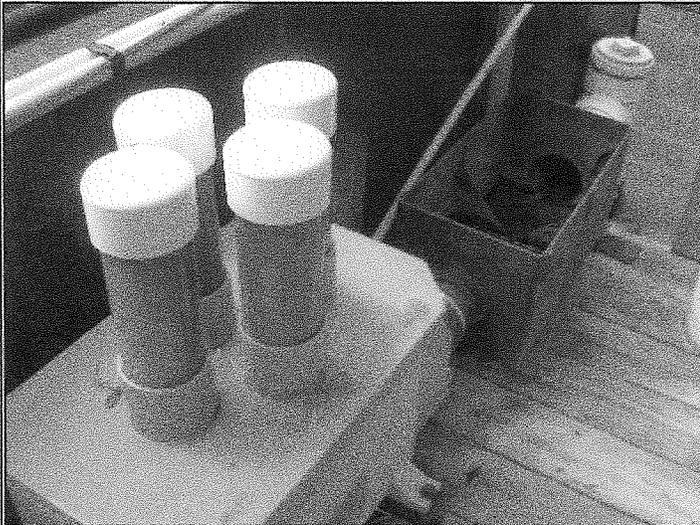
Photograph 5: V-notch weir to CCT



Photograph 6: Chlorine contact tank

VA DEQ Wastewater Facility Inspection Report

Tides North WWTP: VA0029351
Digital Photographs Taken: 6/6/12



Photograph 7: Dechlorination tablet feed box



Photograph 8: Outfall 001



Photograph 9: Fire suppression pond



DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road, Glen Allen, VA 23060-6296

804/527-5020

MEMORANDUM

To: File

From: Laura Galli, VPDES Permit Writer
Piedmont Regional Office

Subject: Permit Reissuance Site Visit
VA0029351 Tides Utilities South WWTP

Date: February 10, 2015

On February 10, 2015, I visited the Tides Utilities South WWTP as part of the Permit reissuance process. At this time of the year the flow at the plant is very low due to the Resort being closed. The plant is equipped with grit removals, a bar screen and a comminutor, which are located at the former WWTP location (**Figure 1**), in the proximity of Outfall 001. The components of the former WWTP (i.e. aeration basin, clarifier, polishing pond) are still in place and in very rusty conditions. The polishing pond is currently being used as an emergency fire water supply with a nearby pump connection (**Figure 2**). The comminutor was observed in operation. The Influent Pump Station receives gravity flow from most buildings, and flow from the Commodore, Dock House, and Garden House Pump Stations. These stations are checked daily by maintenance staff, portable generator and portable pumps are available if needed. Should the pumps fail at the Influent Pump Station, wastewater would back flow to the aeration basin of the former WWTP, where it can be returned to the current WWTP. The plant is equipped with a surge tank, which receives the wastewater from the influent pump station, and two sequenced batch reactors (SBR) (**Figure 3**). Excess flow can be diverted to the surge tank by valve, so flow to the SBR units is regulated. The SBR units are equipped with two decant pumps and two waste pumps in each. Each batch is treated in the following cycles: fill - mix cycle (two mechanical mixers), react cycle, settle cycle, and decant cycle. Each batch takes 8 to 12 hours to go through all cycles depending on influent flow. Three small blowers provide aeration for the SBR by time clock (**Figure 4**). The system appears to be in good operating conditions. Decant water flows to a decant tank prior to being pumped to chlorine contact tank via a flow equalization metering unit (**Figure 5 and 6**). The effluent appears very clear. The discharge flows by gravity back to the former WWTP location through a submerged pipe. Outfall 001 is equipped with a diffuser (**Figure 7**).



Figure 1: Bar Screen and Comminutor



Figure 2: Polishing lagoon at former WWTP



Figure 3: Flow Equalization Tank (right) and SBR unit (left)



Figure 4: Blowers to provide aeration to SBR.



Figure 5: Decant Tank and Flow Meter.



Figure 6: Chlorine Contact Tank.



Figure 7: Outfall 001 Diffuser.

**DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
LABORATORY INSPECTION REPORT**

PERMIT #: VA0029351	INSPECTION DATE: June 6, 2012	PREVIOUS INSP. DATE: May 8, 2007	PREVIOUS EVALUATION: No Deficiencies	TIME SPENT: 10 hours w/ travel & report
NAME/ADDRESS OF FACILITY: The Tides Inn Utilities, LLC.-South P.O. Box 480 Irvington, VA 22480	FACILITY CLASS: () MAJOR (X) MINOR () SMALL () VPA	FACILITY TYPE: (X) MUNICIPAL () INDUSTRIAL () FEDERAL () COMMERCIAL or Contract LAB		UNANNOUNCED INSPECTION? () YES (X) NO
				FFY-SCHEDULED INSPECTION? (X) YES () NO
INSPECTOR(S): <i>MW 6/19/12</i> Meredith Williams, Heather Horne	REVIEWERS: <i>Kw 6/20/12</i>	PRESENT AT INSPECTION: Allen Hall, Operator		
LABORATORY EVALUATION			DEFICIENCIES?	
			Yes	No
LABORATORY RECORDS				X
GENERAL SAMPLING & ANALYSIS				X
LABORATORY EQUIPMENT				X
DISSOLVED OXYGEN ANALYSIS PROCEDURES				X
pH ANALYSIS PROCEDURES				X
TOTAL RESIDUAL CHLORINE ANALYSIS PROCEDURES				X
QUALITY ASSURANCE/QUALITY CONTROL				
Y/N	QUALITY ASSURANCE METHOD	PARAMETERS	FREQUENCY	
N	REPLICATE SAMPLES			
N	SPIKED SAMPLES			
Y	STANDARD SAMPLES	pH, TRC		
N	SPLIT SAMPLES			
N	SAMPLE BLANKS			
N	OTHER			
EPA DRINKING WATER DATA		RATING	No Deficiency	Deficiency
QC SAMPLES PROVIDED?		RATING	No Deficiency	Deficiency
COPIES TO: () DEQ - RO; () DEQ CO - OPWCA; () OWNER; () EPA-Region III; () Other:				

LABORATORY RECORDS SECTION

LABORATORY RECORDS INCLUDE THE FOLLOWING:

<input checked="" type="checkbox"/>	SAMPLING DATE	<input checked="" type="checkbox"/>	ANALYSIS DATE	<input checked="" type="checkbox"/>	CONT MONITORING CHART
<input checked="" type="checkbox"/>	SAMPLING TIME	<input checked="" type="checkbox"/>	ANALYSIS TIME	<input checked="" type="checkbox"/>	INSTRUMENT CALIBRATION
<input checked="" type="checkbox"/>	SAMPLE LOCATION	<input checked="" type="checkbox"/>	TEST METHOD	<input checked="" type="checkbox"/>	INSTRUMENT MAINTENANCE
				<input checked="" type="checkbox"/>	CERTIFICATE OF ANALYSIS

WRITTEN INSTRUCTIONS INCLUDE THE FOLLOWING:

<input checked="" type="checkbox"/>	SAMPLING SCHEDULES	<input checked="" type="checkbox"/>	CALCULATIONS	<input checked="" type="checkbox"/>	ANALYSIS PROCEDURES
-------------------------------------	--------------------	-------------------------------------	--------------	-------------------------------------	---------------------

	YES	NO	N/A
DO ALL ANALYSTS INITIAL THEIR WORK?	X		
DO BENCH SHEETS INCLUDE ALL INFORMATION NECESSARY TO DETERMINE RESULTS?	X		
IS THE DMR COMPLETE AND CORRECT? MONTH(S) REVIEWED: April 2012 DMR and associated data *See comments on page 3	X*		
ARE ALL MONITORING VALUES REQUIRED BY THE PERMIT REPORTED?	X		

GENERAL SAMPLING AND ANALYSIS SECTION

	YES	NO	N/A
ARE SAMPLE LOCATION(S) ACCORDING TO PERMIT REQUIREMENTS?	X		
ARE SAMPLE COLLECTION PROCEDURES APPROPRIATE?	X		
IS SAMPLE EQUIPMENT CONDITION ADEQUATE?	X		
IS FLOW MEASUREMENT ACCORDING TO PERMIT REQUIREMENTS?	X		
ARE COMPOSITE SAMPLES REPRESENTATIVE OF FLOW?	X		
ARE SAMPLE HOLDING TIMES AND PRESERVATION ADEQUATE?	X		
IF ANALYSIS IS PERFORMED AT ANOTHER LOCATION, ARE SHIPPING PROCEDURES ADEQUATE? LIST PARAMETERS AND NAME & ADDRESS OF LAB: BOD₅, TSS, NH₃, Fecal Coliform and Copper are analyzed by J.R. Reed & Associates	X		

ANALYTICAL EQUIPMENT SECTION

	YES	NO	N/A
IS ANALYTICAL EQUIPMENT IN PROPER OPERATING RANGE?			
ARE ANNUAL THERMOMETER CALIBRATION(S) ADEQUATE?	X		
IS THE LOCATION OF THE WATER SOURCE ADEQUATE?			
ARE ALL TITRATIONS PERFORMED ADEQUATE?			

**DEPARTMENT OF ENVIRONMENTAL QUALITY – WATER DIVISION
LABORATORY INSPECTION REPORT SUMMARY**

FACILITY NAME:	The Tides Inn Utilities, LLC-South	Permit #:	VA0029351	INSPECTION DATE:	June 6, 2012
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LABORATORY EVALUATION	X	No Deficiencies
		Deficiency <i>[REQUEST for CORRECTIVE ACTION]</i>

LABORATORY RECORDS

Laboratory Records section deficiency and required action:

- It appears a minor error was made in reporting the minimum pH for April 2012. 8.33 SU was reported instead of 8.0 SU. [No response necessary]

Note: Please keep in mind the following permit specified QL's: BOD₅= 5.0mg/L; Ammonia= 0.20mg/L; Copper= 29 ug/L; TSS= 1.0mg/L. If all results for the month are less than these QL's, report "<QL" on the DMR.

GENERAL SAMPLING AND ANALYSIS

General Sampling and Analysis section deficiency and required action:

- None at this time.

LABORATORY EQUIPMENT

Laboratory Equipment section deficiency and required action:

- None at this time.

Remember to conduct the annual thermistor verifications on the D.O. and pH meters.

PARAMETER SUMMARY

pH

*pH deficiency and required action:

- Please see the enclosed form and complete the Initial Demonstration of Capability (IDC). This is a one-time test for any operator/analyst who may perform [New Guidance]
- Because the pH meter is only capable of a 2 point calibration, begin reading the buffer 4 as a sample to ensure the meter can produce accurate results at that level. [New Guidance]
- Also, reread the buffer 7 as a sample to verify the meter calibrated properly. If the result is greater than +/- 0.1 SU, the calibration should be conducted again.

Total Residual Chlorine (TRC)

*TRC deficiency and required action:

- Please see the enclosed form and complete the Initial Demonstration of Capability (IDC). This is a one-time test for any operator/analyst who may perform [New Guidance]
- The buffering capability of the DPD pillows must be checked and documented annually. Pillows are supposed to adjust the sample pH to between 6 and 7 SU.
- The high and low Spec Check standards are now required to be analyzed daily. Please begin documenting these checks daily. [New Guidance]

Dissolved Oxygen (D.O.)

*D.O. deficiency and required action:

- Please see the enclosed form and complete the Initial Demonstration of Capability (IDC). This is a one-time test for any operator/analyst who may perform [New Guidance]
- Documentation of the daily D.O. meter calibration is required in order to show that the meter is calibrated properly.

***The items listed above were thoroughly discussed on site during the inspection. These items are either considered minor or are new guidance. Therefore, no further response is necessary at this time.**

ANALYST:	Allen Hall	VPDES NO	VA0029351
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Meter: YSI 55 D.O. meter and probe

Parameter: Dissolved Oxygen
 Method: Membrane Electrode
 Facility Elevation 20'
1/08

METHOD OF ANALYSIS:

	18 th Edition of Standard Methods – 4500-O G
	21 st or Online Editions of Standard Methods – 4500-O G (01)

DO is a method-defined analyte so modifications are not allowed. [40 CFR Part 136.6]		Y	N
1)	If samples are collected, is collection carried out with a minimum of turbulence and air bubble formation and is the sample bottle allowed to overflow several times its volume? [1.c]	In situ	
2)	Are meter and electrode operable and providing consistent readings? [3]	X	
3)	Is membrane in good condition without trapped air bubbles? [3.b]	X	
4)	Is correct filling solution used in electrode? [Mfr.]	X	
5)	Are water droplets shaken off the membrane prior to calibration? [Mfr.]	X	
6)	Is meter calibrated before use or at least daily? [Mfr. & Part 1020]	X	
7)	Is calibration procedure performed according to manufacturer's instructions? [Mfr.]	X	
8)	Is sample stirred during analysis? [Mfr.]	In situ	
9)	Is the sample analysis procedure performed according to manufacturer's instructions? [Mfr.]	X	
10)	Is meter stabilized before reading D.O.? [Mfr.]	X	
11)	Is electrode stored according to manufacturer's instructions? [Mfr.]	X	
12)	Is a duplicate sample analyzed after every 20 samples if citing 18 th or 19 th Edition or daily if citing 20 th or 21 st Edition? [Part 1020] NOTE: Not required for <i>in situ</i> samples.	Duplicates are no longer required by DEQ.	
13)	If a duplicate sample is analyzed, is the reported value for that sampling event the average concentration of the sample and the duplicate? [DEQ]		
14)	If a duplicate sample is analyzed, is the relative percent difference (RPD) ≤ 20? [18 th ed. Table 1020 I; 21 st ed. DEQ]		

PROBLEMS: Documentation of the daily meter calibration is required. Also, an IDC needs to be performed and documentation maintained on site. See enclosed form for instructions.

ANALYST:	Allen Hall	VPDES NO	VA0029351
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Meter: JENCO Model 671-P

Parameter: Hydrogen Ion (pH)

1/08

Method: Electrometric

METHOD OF ANALYSIS:

X	18 th Edition of Standard Methods – 4500-H ⁺ B
	21 st or Online Editions of Standard Methods – 4500-H ⁺ B (00)

pH is a method-defined analyte so modifications are not allowed. [40 CFR Part 136.6]

	Y	N
1) Is a certificate of operator competence or initial demonstration of capability available for <u>each analyst/operator</u> performing this analysis? NOTE: Analyze 4 samples of known pH. May use external source of buffer (different lot/manufacturer than buffers used to calibrate meter). Recovery for each of the 4 samples must be +/- 0.1 SU of the known concentration of the sample. [SM 1020 B.1]		X
2) Is the electrode in good condition (no chloride precipitate, scratches, deterioration, etc.)? [2.b/c and 5.b]	X	
3) Is electrode storage solution in accordance with manufacturer's instructions? [Mfr.]	X	
4) Is meter calibrated on at least a daily basis using three buffers all of which are at the same temperature? [4.a] NOTE: Follow manufacturer's instructions.		X
5) After calibration, is a buffer analyzed as a check sample to verify that calibration is correct? Agreement should be within +/- 0.1 SU. [4.a]		X
6) Do the buffer solutions appear to be free of contamination or growths? [3.1]	X	
7) Are buffer solutions within the listed shelf-life or have they been prepared within the last 4 weeks? [3.a]	X	
8) Is the cap or sleeve covering the access hole on the reference electrode removed when measuring pH? [Mfr.]	X	
9) For meters with ATC that also have temperature display, is the thermometer verified annually? [SM 2550 B.1] Meter is less than 1 year old	X	
10) Is temperature of buffer solutions and samples recorded when determining pH? [4.a]	X	
11) Is sample analyzed within 15 minutes of collections? [40 CFR Part 136]	X	
12) Is the electrode rinsed and then blotted dry between reading solutions (Disregard if a portion of the next sample analyzed is used as the rinsing solution.)? [4.a]	X	
13) Is the sample stirred gently at a constant speed during measurement? [4.b]	X	
14) Does the meter hold a steady reading after reaching equilibrium? [4.b]	X	
15) Is a duplicate sample analyzed after every 20 samples if citing 18 th or 19 th Edition or daily for 20 th or 21 st Edition? [Part 1020] NOTE: Not required for <i>in situ</i> samples.	DEQ no longer requires duplicates to be analyzed.	
16) Is the pH of duplicate samples within 0.1SU of the original sample? [Part 1020]		
17) Is there a written procedure for which result will be reported on DMR (Sample or Duplicate) and is this procedure followed? [DEQ]		

PROBLEMS: Please see the enclosed form and complete the Initial Demonstration of Capability (IDC). Because the pH meter is only capable of a 2 point calibration, begin reading the buffer 4 as a sample to ensure the meter can produce accurate results at that level. Also, reread the buffer 7 as a sample to verify the meter calibrated properly. If the result is greater than +/- 0.1 SU, the calibration should be conducted again.

ANALYST:	Allen Hall	VPDES NO.	VA0029351
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Instrument: HACH Pocket Colorimeter II Parameter: Total Residual Chlorine (TRC)
 Method: DPD Colorimetric (HACH Pocket Colorimeter)
 1/08

METHOD OF ANALYSIS:

<input checked="" type="checkbox"/>	HACH Manufacturer's Instructions (Method 8167) plus an edition of <i>Standard Methods</i>
<input checked="" type="checkbox"/>	18 th Edition of <i>Standard Methods</i> 4500-CI G
<input type="checkbox"/>	21 st Edition of <i>Standard Methods</i> 4500-CI G (00)

	Y	N
1) Is a certificate of operator competence or initial demonstration of capability available for <u>each analyst/operator</u> performing this analysis? NOTE: Analyze 4 samples of known TRC. Must use a lot number or source that is different from that used to prepare calibration standards. May not use Specv™. [SM 1020 B.1]		X
2) Are the DPD PermaChem™ Powder Pillows stored in a cool, dry place? [Mfr.]	X	
3) Are the pillows within the manufacturer's expiration date? [Mfr.]	X	
4) Has buffering capability of DPD pillows been checked annually? (Pillows should adjust sample pH to between 6 and 7) [Mfr.]		X
5) When pH adjustment is required, is H ₂ SO ₄ or NaOH used? [Hach 11.3.1]	N/A	
6) Are cells clean and in good condition? [Mfr.]	X	
7) Is the low range (0.01 mg/L resolution) used for samples containing residuals from 0.2.00 mg/L? [Mfr.]	X	
8) Is calibration curve developed (may use manufacturer's calibration) with daily verification using a high and a low standard? NOTE: May use manufacturer's installed calibration and commercially available chlorine standards for daily calibration verifications. [18 th ed 1020 B.5; 21 st ed 4020 B.2.b]		X
9) Is the 10-mL cell (2.5-cm diameter) used for samples from 0-2.00 mg/L? [Mfr.]	X	
10) Is meter zeroed correctly by using sample as blank for the cell used? [Mfr.]	X	
11) Is the instrument cap placed correctly on the meter body when the meter is zeroed and when the sample is analyzed? [Mfr.]	X	
12) Is the DPD Total Chlorine PermaChem™ Powder Pillow mixed into the sample? [Hach 11.1]	X	
13) Is the analysis made at least three minutes but not more than six minutes after PermaChem™ Powder Pillow addition? [Hach 11.2]	X	
14) If read-out is flashing [2.20], is sample diluted correctly, and then reanalyzed? [Hach 1.2 & 2.0]	X	
15) Are samples analyzed within 15 minutes of collection? [40 CFR Part 136]	X	
16) Is a duplicate sample analyzed after every 20 samples if citing 18 th Edition [SM 1020 B.6] or daily for 21 st Edition [SM 4020 B.3.c]?	Duplicates are not required by DEQ.	
17) If duplicate sample is analyzed, is the relative percent difference (RPD) =20? [18 th ed. Table 1020 I; 21 st ed. DEQ]		

PROBLEMS: **An IDC must be completed and documentation maintained on site. The buffering capability of the DPD pillows should be checked and documented annually. The Spec Check standards are now required to be analyzed daily.**

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
EQUIPMENT TEMPERATURE LOG/THERMOMETER VERIFICATION CHECK SHEET

1/08

FACILITY NAME:	The Tides Inn Utilities, LLC-South				VPDES NO:	VA0029351	DATE:	June 6, 2012				
EQUIPMENT	RANGE	IN RANGE		INSPECT READING °C	CHECK & LOG DAILY		CORRECT INCREMENT	ANNUAL THERMOMETER VERIFICATION				
		Y	N		Y	N		Y	N	DATE CHECKED	MARKED	CORR FACTOR °C
								Is the NIST / NIST-Traceable Reference Thermometer within the manufacturer's expiration date or recertified yearly?			Y/N N/A	
SAMPLE REFRIGER.	1-6°C											
AUTO SAMPLER	1-6° C											
PROBING DEVICE												
SCOURING DEVICE												
WATER TAP												
WATER TAP												
WATER TAP												
WATER TAP												
WATER TAP												
WATER TAP												
PREPARED METERS												
pH METER	± 1° C			Not on							*	
DO METER	± 1° C			20.7							*	
THERMOMETER-OUTFALL	± 1° C											
WATER TAP												

PROBLEMS: None.
 COMMENTS: *The D.O. meter and pH meter are less than 1 year old. Please remember that the annual thermistor verification will need to be completed and documentation maintained on site. Composite sample aliquots are kept on ice until the end of the 4HC. The samples are transported by Mr. Hall to the laboratory on ice in pre-preserved bottles from the contract lab.

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
SAMPLE ANALYSIS HOLDING TIME/CONTAINER/PRESERVATION CHECK SHEET

Revised 7/05 [40 CFR, Part 136.3, Table II]

FACILITY NAME:		VPDES NO			DATE:								
PARAMETER	HOLDING TIMES APPROVED	MET?			LOGGED?			SAMPLE CONTAINER			PRESERVATION		
		Y	N		Y	N		ADEQ. VOLUME	APPROP. TYPE	APPROVED	MET?	CHECKED?	
								Y	N	Y	N	Y	N
BOD5 & CBOD5	48 HOURS												
TSS	7 DAYS												
FECAL COLIFORM / <i>E. coli</i> / <i>Enterococci</i>	6 HRS & 2 HRS TO PROCESS												
pH	15 MIN.	X			X			X		N/A			
CHLORINE	15 MIN.	X			X			X		N/A			
DISSOLVED O ₂	15 MIN./IN SITU	X			X			X		N/A			
TEMPERATURE	IMMERSION STAB.									N/A			
OIL & GREASE	28 DAYS									4° C+H ₂ SO ₄ /HCL pH<2			
AMMONIA	28 DAYS									4° C+H ₂ SO ₄ pH<2 DECHLOR			
TKN	28 DAYS									4° C+H ₂ SO ₄ pH<2 DECHLOR			
NITRATE	48 HOURS									4° C			
NITRATE+NITRITE	28 DAYS									4° C+H ₂ SO ₄ pH<2			
NITRITE	48 HOURS									4° C			
PHOSPHATE, ORTHO	48 HOURS									FILTER, 4° C			
TOTAL PHOS.	28 DAYS									4° C+H ₂ SO ₄ pH<2			
METALS (except Hg)	6 MONTHS									HNO ₃ pH<2			
MERCURY	28 DAYS									HNO ₃ pH<2			
PROBLEMS: None.													

ATTACHMENT E

Effluent Data

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			0.0118	0.0289	NULL	NULL	NULL	4-Apr-13
			0.0137	0.0313	NULL	NULL	NULL	3-May-13
			0.0177	0.0349	NULL	NULL	NULL	7-Jun-13
			0.0251	0.0488	NULL	NULL	NULL	8-Jul-13
			0.0206	0.0439	NULL	NULL	NULL	5-Aug-13
			0.0238	0.0328	NULL	NULL	NULL	6-Sep-13
			0.0186	0.0401	NULL	NULL	NULL	9-Oct-13
			0.0145	0.0295	NULL	NULL	NULL	5-Nov-13
			0.0110	0.0272	NULL	NULL	NULL	6-Dec-13
			0.0089	0.0281	NULL	NULL	NULL	8-Jan-14
			0.0031	0.0260	NULL	NULL	NULL	7-Feb-14
			0.0015	0.0160	NULL	NULL	NULL	5-Mar-14
			0.0087	0.0265	NULL	NULL	NULL	7-Apr-14
	002	pH	NULL	NULL	NULL	8.16	8.45	7-Jun-10
			NULL	NULL	NULL	8.32	8.72	8-Jul-10
			NULL	NULL	NULL	8.44	8.79	6-Aug-10
			NULL	NULL	NULL	8.19	8.6	8-Sep-10
			NULL	NULL	NULL	8.18	8.51	7-Oct-10
			NULL	NULL	NULL	8.08	8.62	4-Nov-10
			NULL	NULL	NULL	8.17	8.72	7-Dec-10
			NULL	NULL	NULL	8.4	8.79	6-Jan-11
			NULL	NULL	NULL	8.73	8.84	3-Feb-11
			NULL	NULL	NULL	8.35	8.65	7-Mar-11
			NULL	NULL	NULL	8.04	8.52	5-Apr-11
			NULL	NULL	NULL	7.94	8.72	6-May-11
			NULL	NULL	NULL	8.2	8.62	7-Jun-11
			NULL	NULL	NULL	8.23	8.56	7-Jul-11
			NULL	NULL	NULL	8.08	8.59	4-Aug-11
			NULL	NULL	NULL	8.14	8.59	8-Sep-11
			NULL	NULL	NULL	8.24	8.68	4-Oct-11
			NULL	NULL	NULL	8.29	8.89	3-Nov-11
			NULL	NULL	NULL	8.52	8.81	8-Dec-11
			NULL	NULL	NULL	8.35	8.8	5-Jan-12
			NULL	NULL	NULL	8.47	8.78	2-Feb-12
			NULL	NULL	NULL	8.43	8.74	7-Mar-12
			NULL	NULL	NULL	8.2	8.78	5-Apr-12

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			NULL	NULL	NULL	8.33	8.81	4-May-12
			NULL	NULL	NULL	8.49	8.85	6-Jun-12
			NULL	NULL	NULL	8.35	9	6-Jul-12
			NULL	NULL	NULL	8.3	8.83	7-Aug-12
			NULL	NULL	NULL	8.2	8.84	7-Sep-12
			NULL	NULL	NULL	8.21	8.81	9-Oct-12
			NULL	NULL	NULL	8.13	8.82	8-Nov-12
			NULL	NULL	NULL	8.27	8.79	6-Dec-12
			NULL	NULL	NULL	8.25	8.71	8-Jan-13
			NULL	NULL	NULL	8.17	8.72	7-Feb-13
			NULL	NULL	NULL	NULL	NULL	7-Mar-13
			NULL	NULL	NULL	8.01	8.69	4-Apr-13
			NULL	NULL	NULL	8.15	8.69	3-May-13
			NULL	NULL	NULL	8.18	8.63	7-Jun-13
			NULL	NULL	NULL	7.87	8.87	8-Jul-13
			NULL	NULL	NULL	8.17	8.8	5-Aug-13
			NULL	NULL	NULL	8.25	8.82	6-Sep-13
			NULL	NULL	NULL	8.3	8.73	9-Oct-13
			NULL	NULL	NULL	8.1	8.59	5-Nov-13
			NULL	NULL	NULL	8.2	8.73	6-Dec-13
			NULL	NULL	NULL	8.04	8.72	8-Jan-14
			NULL	NULL	NULL	8.22	8.61	7-Feb-14
			NULL	NULL	NULL	8.12	8.37	5-Mar-14
			NULL	NULL	NULL	8.11	8.69	7-Apr-14
				90th Percentile			8.84	
				10th Percentile			8.575	
	003	BOD5	70	120	1.75	NULL	3	7-Jun-10
			116	190	1.6	NULL	2	8-Jul-10
			160	160	1	NULL	2	6-Aug-10
			137.5	260	1.75	NULL	3	8-Sep-10
			26	70	2	NULL	2	7-Oct-10
			95	110	2.5	NULL	4	4-Nov-10
			57.5	90	2.5	NULL	3	7-Dec-10
			78	90	2.6	NULL	3	6-Jan-11
			50	80	2.7	NULL	3	3-Feb-11
			72.5	70	3	NULL	4	7-Mar-11

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			118	160	3.8	NULL	7	5-Apr-11
			67.5	120	2.25	NULL	3	6-May-11
			97.5	190	1.75	NULL	2	7-Jun-11
			118	90	2.2	NULL	3	7-Jul-11
			197.5	290	2.75	NULL	3	4-Aug-11
			218	360	3	NULL	5	8-Sep-11
			135	210	2.5	NULL	3	4-Oct-11
			122.5	180	3	NULL	4	3-Nov-11
			60	100	1.8	NULL	3	8-Dec-11
			77.5	120	2.5	NULL	3	5-Jan-12
			125	180	3	NULL	4	2-Feb-12
			102.5	150	3	NULL	4	7-Mar-12
			130	87.5	2.5	NULL	4	5-Apr-12
			82.5	200	1.75	NULL	4	4-May-12
			168	80	2	NULL	5	6-Jun-12
			85	100	1.25	NULL	2	6-Jul-12
			170	260	1.6	NULL	2	7-Aug-12
			167.5	240	1.5	NULL	2	7-Sep-12
			100	65	1	NULL	1	9-Oct-12
			112	110	2.2	NULL	6	8-Nov-12
			88	120	2.25	NULL	3	6-Dec-12
			220	153	2.75	NULL	4	8-Jan-13
			152.5	170	2.5	NULL	4	7-Feb-13
			NULL	NULL	NULL	NULL	NULL	7-Mar-13
			305	400	4.5	NULL	7	4-Apr-13
			145	210	3.25	NULL	4	3-May-13
			76	120	1.6	NULL	2	7-Jun-13
			75	100	1.25	NULL	2	8-Jul-13
			102.5	120	2	NULL	3	5-Aug-13
			92	100	1.2	NULL	2	6-Sep-13
			90	180	1.5	NULL	2	9-Oct-13
			86	140	2	NULL	3	5-Nov-13
			92.5	130	2.5	NULL	3.0	6-Dec-13
			87.5	180	2.75	NULL	3	8-Jan-14
			208	390	3.4	NULL	7	7-Feb-14
			267	300	5	NULL	6	5-Mar-14

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			190	420	3.5	NULL	6	7-Apr-14
	004	TSS	80	80	2.2	NULL	2.2	7-Jun-10
			110	110	1.6	NULL	1.6	8-Jul-10
			230	230	6.4	NULL	6.4	6-Aug-10
			360	360	4.2	NULL	4.2	8-Sep-10
			500	500	13	NULL	13	7-Oct-10
			220	220	4	NULL	4	4-Nov-10
			110	110	3.6	NULL	3.6	7-Dec-10
			150	150	5	NULL	5	6-Jan-11
			150	150	5.4	NULL	5.4	3-Feb-11
			250	250	12	NULL	12	7-Mar-11
			200	200	4.3	NULL	4.3	5-Apr-11
			70	70	5.1	NULL	5.1	6-May-11
			270	270	2.9	NULL	2.9	7-Jun-11
			270	270	5.9	NULL	5.9	7-Jul-11
			370	370	3.9	NULL	3.9	4-Aug-11
			400	400	5.4	NULL	5.4	8-Sep-11
			200	200	4.8	NULL	4.8	4-Oct-11
			240	240	7.6	NULL	7.6	3-Nov-11
			60	60	2.8	NULL	2.8	8-Dec-11
			160	160	5.6	NULL	5.6	5-Jan-12
			70	70	1.6	NULL	1.6	2-Feb-12
			320	320	9.2	NULL	9.2	7-Mar-12
			180	180	5.3	NULL	5.3	5-Apr-12
			30	30	1	NULL	1	4-May-12
			260	260	3.9	NULL	3.9	6-Jun-12
			360	360	3.8	NULL	3.8	6-Jul-12
			430	430	3.3	NULL	3.3	7-Aug-12
			250	250	2.5	NULL	2.5	7-Sep-12
			220	220	2.7	NULL	2.7	9-Oct-12
			870	870	7.7	NULL	7.7	8-Nov-12
			150	150	4	NULL	4	6-Dec-12
			160	160	2.9	NULL	2.9	8-Jan-13
			370	370	6.7	NULL	6.7	7-Feb-13
			NULL	NULL	NULL	NULL	NULL	7-Mar-13
			400	400	3.7	NULL	3.7	4-Apr-13

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			180	180	2.5	NULL	2.5	3-May-13
			100	100	2	NULL	2	7-Jun-13
			90	90	1.8	NULL	1.8	8-Jul-13
			110	110	2.6	NULL	2.6	5-Aug-13
			190	190	2.5	NULL	2.5	6-Sep-13
			290	290	3.1	NULL	3.1	9-Oct-13
			160	160	4.9	NULL	4.9	5-Nov-13
			150	150	4.6	NULL	4.6	6-Dec-13
			310	310	5.3	NULL	5.3	8-Jan-14
			280	280	6.4	NULL	6.4	7-Feb-14
			730	730	17	NULL	17	5-Mar-14
			440	440	6.3	NULL	6.3	7-Apr-14
	005	CL2, TOTAL	NULL	NULL	<QL	NULL	<QL	7-Jun-10
			NULL	NULL	<QL	NULL	<QL	8-Jul-10
			NULL	NULL	<QL	NULL	<QL	6-Aug-10
			NULL	NULL	<QL	NULL	<QL	8-Sep-10
			NULL	NULL	<QL	NULL	<QL	7-Oct-10
			NULL	NULL	<QL	NULL	<QL	4-Nov-10
			NULL	NULL	<QL	NULL	<QL	7-Dec-10
			NULL	NULL	<QL	NULL	<QL	6-Jan-11
			NULL	NULL	<QL	NULL	<QL	3-Feb-11
			NULL	NULL	<QL	NULL	<QL	7-Mar-11
			NULL	NULL	<QL	NULL	<QL	5-Apr-11
			NULL	NULL	<QL	NULL	<QL	6-May-11
			NULL	NULL	<QL	NULL	<QL	7-Jun-11
			NULL	NULL	<QL	NULL	<QL	7-Jul-11
			NULL	NULL	<QL	NULL	<QL	4-Aug-11
			NULL	NULL	<QL	NULL	<QL	8-Sep-11
			NULL	NULL	<QL	NULL	<QL	4-Oct-11
			NULL	NULL	<QL	NULL	<QL	3-Nov-11
			NULL	NULL	<QL	NULL	<QL	8-Dec-11
			NULL	NULL	<QL	NULL	<QL	5-Jan-12
			NULL	NULL	<QL	NULL	<QL	2-Feb-12
			NULL	NULL	<QL	NULL	<QL	7-Mar-12
			NULL	NULL	<QL	NULL	<QL	5-Apr-12

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			NULL	NULL	<QL	NULL	<QL	4-May-12
			NULL	NULL	<QL	NULL	<QL	6-Jun-12
			NULL	NULL	<QL	NULL	<QL	6-Jul-12
			NULL	NULL	<QL	NULL	<QL	7-Aug-12
			NULL	NULL	<QL	NULL	<QL	7-Sep-12
			NULL	NULL	<QL	NULL	<QL	9-Oct-12
			NULL	NULL	<QL	NULL	<QL	8-Nov-12
			NULL	NULL	<QL	NULL	<QL	6-Dec-12
			NULL	NULL	<QL	NULL	<QL	8-Jan-13
			NULL	NULL	<QL	NULL	<QL	7-Feb-13
			NULL	NULL	NULL	NULL	NULL	7-Mar-13
			NULL	NULL	<QL	NULL	<QL	4-Apr-13
			NULL	NULL	<QL	NULL	<QL	3-May-13
			NULL	NULL	<QL	NULL	<QL	7-Jun-13
			NULL	NULL	<QL	NULL	<QL	8-Jul-13
			NULL	NULL	<QL	NULL	<QL	5-Aug-13
			NULL	NULL	<QL	NULL	<QL	6-Sep-13
			NULL	NULL	<QL	NULL	<QL	9-Oct-13
			NULL	NULL	<QL	NULL	<QL	5-Nov-13
			NULL	NULL	<QL	NULL	<QL	6-Dec-13
			NULL	NULL	<QL	NULL	<QL	8-Jan-14
			NULL	NULL	<QL	NULL	<QL	7-Feb-14
			NULL	NULL	<QL	NULL	<QL	5-Mar-14
			NULL	NULL	<QL	NULL	<QL	7-Apr-14
	006	COLIFORM, FECAL	NULL	NULL	2	NULL	NULL	7-Jun-10
			NULL	NULL	4	NULL	NULL	8-Jul-10
			NULL	NULL	3	NULL	NULL	6-Aug-10
			NULL	NULL	3	NULL	NULL	8-Sep-10
			NULL	NULL	3	NULL	NULL	7-Oct-10
			NULL	NULL	3	NULL	NULL	4-Nov-10
			NULL	NULL	2	NULL	NULL	7-Dec-10
			NULL	NULL	2	NULL	NULL	6-Jan-11
			NULL	NULL	2	NULL	NULL	3-Feb-11
			NULL	NULL	2	NULL	NULL	7-Mar-11
			NULL	NULL	2	NULL	NULL	5-Apr-11

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			NULL	NULL	3	NULL	NULL	6-May-11
			NULL	NULL	3	NULL	NULL	7-Jun-11
			NULL	NULL	2	NULL	NULL	7-Jul-11
			NULL	NULL	4	NULL	NULL	4-Aug-11
			NULL	NULL	5	NULL	NULL	8-Sep-11
			NULL	NULL	2	NULL	NULL	4-Oct-11
			NULL	NULL	3	NULL	NULL	3-Nov-11
			NULL	NULL	2	NULL	NULL	8-Dec-11
			NULL	NULL	1	NULL	NULL	5-Jan-12
			NULL	NULL	2	NULL	NULL	2-Feb-12
			NULL	NULL	1	NULL	NULL	7-Mar-12
			NULL	NULL	2	NULL	NULL	5-Apr-12
			NULL	NULL	1	NULL	NULL	4-May-12
			NULL	NULL	1	NULL	NULL	6-Jun-12
			NULL	NULL	1	NULL	NULL	6-Jul-12
			NULL	NULL	1	NULL	NULL	7-Aug-12
			NULL	NULL	1	NULL	NULL	7-Sep-12
			NULL	NULL	4	NULL	NULL	9-Oct-12
			NULL	NULL	1	NULL	NULL	8-Nov-12
			NULL	NULL	2	NULL	NULL	6-Dec-12
			NULL	NULL	1	NULL	NULL	8-Jan-13
			NULL	NULL	1	NULL	NULL	7-Feb-13
			NULL	NULL	NULL	NULL	NULL	7-Mar-13
			NULL	NULL	1	NULL	NULL	4-Apr-13
			NULL	NULL	2	NULL	NULL	3-May-13
			NULL	NULL	1	NULL	NULL	7-Jun-13
			NULL	NULL	1	NULL	NULL	8-Jul-13
			NULL	NULL	1	NULL	NULL	5-Aug-13
			NULL	NULL	1	NULL	NULL	6-Sep-13
			NULL	NULL	1	NULL	NULL	9-Oct-13
			NULL	NULL	1	NULL	NULL	5-Nov-13
			NULL	NULL	1	NULL	NULL	6-Dec-13
			NULL	NULL	1	NULL	NULL	8-Jan-14
			NULL	NULL	1	NULL	NULL	7-Feb-14
			NULL	NULL	1	NULL	NULL	5-Mar-14
			NULL	NULL	1	NULL	NULL	7-Apr-14

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
	007	DO	NULL	NULL	NULL	5.54	NULL	7-Jun-10
			NULL	NULL	NULL	5.63	NULL	8-Jul-10
			NULL	NULL	NULL	6.15	NULL	6-Aug-10
			NULL	NULL	NULL	6.0	NULL	8-Sep-10
			NULL	NULL	NULL	6.09	NULL	7-Oct-10
			NULL	NULL	NULL	5.79	NULL	4-Nov-10
			NULL	NULL	NULL	8.25	NULL	7-Dec-10
			NULL	NULL	NULL	8.69	NULL	6-Jan-11
			NULL	NULL	NULL	11.65	NULL	3-Feb-11
			NULL	NULL	NULL	11.08	NULL	7-Mar-11
			NULL	NULL	NULL	11.01	NULL	5-Apr-11
			NULL	NULL	NULL	7.09	NULL	6-May-11
			NULL	NULL	NULL	6.35	NULL	7-Jun-11
			NULL	NULL	NULL	6.1	NULL	7-Jul-11
			NULL	NULL	NULL	6.08	NULL	4-Aug-11
			NULL	NULL	NULL	6.31	NULL	8-Sep-11
			NULL	NULL	NULL	6.37	NULL	4-Oct-11
			NULL	NULL	NULL	7.95	NULL	3-Nov-11
			NULL	NULL	NULL	8.2	NULL	8-Dec-11
			NULL	NULL	NULL	8.99	NULL	5-Jan-12
			NULL	NULL	NULL	11.03	NULL	2-Feb-12
			NULL	NULL	NULL	10.98	NULL	7-Mar-12
			NULL	NULL	NULL	8.59	NULL	5-Apr-12
			NULL	NULL	NULL	8.31	NULL	4-May-12
			NULL	NULL	NULL	7.31	NULL	6-Jun-12
			NULL	NULL	NULL	7.01	NULL	6-Jul-12
			NULL	NULL	NULL	6.44	NULL	7-Aug-12
			NULL	NULL	NULL	6.88	NULL	7-Sep-12
			NULL	NULL	NULL	6.95	NULL	9-Oct-12
			NULL	NULL	NULL	7.13	NULL	8-Nov-12
			NULL	NULL	NULL	9.47	NULL	6-Dec-12
			NULL	NULL	NULL	9.81	NULL	8-Jan-13
			NULL	NULL	NULL	11.25	NULL	7-Feb-13
			NULL	NULL	NULL	NULL	NULL	7-Mar-13
			NULL	NULL	NULL	10.17	NULL	4-Apr-13
			NULL	NULL	NULL	9.01	NULL	3-May-13

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			NULL	NULL	NULL	7.03	NULL	7-Jun-13
			NULL	NULL	NULL	7.2	NULL	8-Jul-13
			NULL	NULL	NULL	6.3	NULL	5-Aug-13
			NULL	NULL	NULL	7.01	NULL	6-Sep-13
			NULL	NULL	NULL	6.74	NULL	9-Oct-13
			NULL	NULL	NULL	7.71	NULL	5-Nov-13
			NULL	NULL	NULL	8.9	NULL	6-Dec-13
			NULL	NULL	NULL	9.94	NULL	8-Jan-14
			NULL	NULL	NULL	12.82	NULL	7-Feb-14
			NULL	NULL	NULL	12.77	NULL	5-Mar-14
			NULL	NULL	NULL	8.66	NULL	7-Apr-14
	039	AMMONIA, AS N	NULL	NULL	<0.10	NULL	.012	7-Jun-10
			NULL	NULL	<0.10	NULL	0.23	8-Jul-10
			NULL	NULL	<0.10	NULL	.014	6-Aug-10
			NULL	NULL	<0.10	NULL	.13	8-Sep-10
			NULL	NULL	<0.10	NULL	0.11	7-Oct-10
			NULL	NULL	<QL	NULL	0.10	4-Nov-10
			NULL	NULL	<0.10	NULL	<0.10	7-Dec-10
			NULL	NULL	0.10	NULL	0.28	6-Jan-11
			NULL	NULL	<0.10	NULL	0.10	3-Feb-11
			NULL	NULL	<QL	NULL	0.11	7-Mar-11
			NULL	NULL	<0.10	NULL	<0.10	5-Apr-11
			NULL	NULL	<0.10	NULL	<0.10	6-May-11
			NULL	NULL	<0.10	NULL	<0.10	7-Jun-11
			NULL	NULL	<0.10	NULL	<0.10	7-Jul-11
			NULL	NULL	<0.10	NULL	<0.10	4-Aug-11
			NULL	NULL	<QL	NULL	0.18	8-Sep-11
			NULL	NULL	<0.10	NULL	<0.10	4-Oct-11
			NULL	NULL	<0.10	NULL	<0.10	3-Nov-11
			NULL	NULL	<0.10	NULL	<0.10	8-Dec-11
			NULL	NULL	<0.10	NULL	<0.10	5-Jan-12
			NULL	NULL	<0.10	NULL	<0.10	2-Feb-12
			NULL	NULL	<QL	NULL	<QL	7-Mar-12
			NULL	NULL	<QL	NULL	<QL	5-Apr-12
			NULL	NULL	<0.10	NULL	<0.10	4-May-12

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			NULL	NULL	<QL	NULL	<QL	6-Jun-12
			NULL	NULL	<QL	NULL	<QL	6-Jul-12
			NULL	NULL	<QL	NULL	0.11	7-Aug-12
			NULL	NULL	<0.10	NULL	<0.10	7-Sep-12
			NULL	NULL	<0.10	NULL	<0.10	9-Oct-12
			NULL	NULL	<0.10	NULL	0.17	8-Nov-12
			NULL	NULL	<QL	NULL	0.16	6-Dec-12
			NULL	NULL	<0.10	NULL	0.15	8-Jan-13
			NULL	NULL	<0.10	NULL	<0.10	7-Feb-13
			NULL	NULL	NULL	NULL	NULL	7-Mar-13
			NULL	NULL	3.13	NULL	7.84	4-Apr-13
			NULL	NULL	<0.10	NULL	<0.10	3-May-13
			NULL	NULL	<QL	NULL	0.11	7-Jun-13
			NULL	NULL	<QL	NULL	0.11	8-Jul-13
			NULL	NULL	<0.10	NULL	0.14	5-Aug-13
			NULL	NULL	<QL	NULL	0.12	6-Sep-13
			NULL	NULL	<0.10	NULL	0.18	9-Oct-13
			NULL	NULL	<0.10	NULL	<0.10	5-Nov-13
			NULL	NULL	.22	NULL	.68	6-Dec-13
			NULL	NULL	<0.10	NULL	0.11	8-Jan-14
			NULL	NULL	0.13	NULL	0.40	7-Feb-14
			NULL	NULL	0.16	NULL	0.18	5-Mar-14
			NULL	NULL	0.12	NULL	0.27	7-Apr-14
		CL2, TOTAL CONTACT						
	157		NULL	NULL	NULL	0.8	NULL	7-Jun-10
			NULL	NULL	NULL	0.6	NULL	8-Jul-10
			NULL	NULL	NULL	0.6	NULL	6-Aug-10
			NULL	NULL	NULL	0.7	NULL	8-Sep-10
			NULL	NULL	NULL	0.9	NULL	7-Oct-10
			NULL	NULL	NULL	1.6	NULL	4-Nov-10
			NULL	NULL	NULL	1.0	NULL	7-Dec-10
			NULL	NULL	NULL	0.8	NULL	6-Jan-11
			NULL	NULL	NULL	0.6	NULL	3-Feb-11
			NULL	NULL	NULL	2.0	NULL	7-Mar-11
			NULL	NULL	NULL	0.6	NULL	5-Apr-11

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			NULL	NULL	NULL	0.7	NULL	6-May-11
			NULL	NULL	NULL	0.6	NULL	7-Jun-11
			NULL	NULL	NULL	0.6	NULL	7-Jul-11
			NULL	NULL	NULL	0.7	NULL	4-Aug-11
			NULL	NULL	NULL	1.2	NULL	8-Sep-11
			NULL	NULL	NULL	0.6	NULL	4-Oct-11
			NULL	NULL	NULL	1.1	NULL	3-Nov-11
			NULL	NULL	NULL	1.2	NULL	8-Dec-11
			NULL	NULL	NULL	0.7	NULL	5-Jan-12
			NULL	NULL	NULL	0.8	NULL	2-Feb-12
			NULL	NULL	NULL	1.6	NULL	7-Mar-12
			NULL	NULL	NULL	1.5	NULL	5-Apr-12
			NULL	NULL	NULL	0.6	NULL	4-May-12
			NULL	NULL	NULL	1.1	NULL	6-Jun-12
			NULL	NULL	NULL	0.6	NULL	6-Jul-12
			NULL	NULL	NULL	1.0	NULL	7-Aug-12
			NULL	NULL	NULL	1.0	NULL	7-Sep-12
			NULL	NULL	NULL	0.6	NULL	9-Oct-12
			NULL	NULL	NULL	1.0	NULL	8-Nov-12
			NULL	NULL	NULL	1.0	NULL	6-Dec-12
			NULL	NULL	NULL	0.6	NULL	8-Jan-13
			NULL	NULL	NULL	1.6	NULL	7-Feb-13
			NULL	NULL	NULL	NULL	NULL	7-Mar-13
			NULL	NULL	NULL	0.7	NULL	4-Apr-13
			NULL	NULL	NULL	1.2	NULL	3-May-13
			NULL	NULL	NULL	0.6	NULL	7-Jun-13
			NULL	NULL	NULL	1.0	NULL	8-Jul-13
			NULL	NULL	NULL	0.6	NULL	5-Aug-13
			NULL	NULL	NULL	0.6	NULL	6-Sep-13
			NULL	NULL	NULL	1.0	NULL	9-Oct-13
			NULL	NULL	NULL	1.0	NULL	5-Nov-13
			NULL	NULL	NULL	0.6	NULL	6-Dec-13
			NULL	NULL	NULL	1.0	NULL	8-Jan-14
			NULL	NULL	NULL	1.6	NULL	7-Feb-14
			NULL	NULL	NULL	2.2	NULL	5-Mar-14
			NULL	NULL	NULL	1.0	NULL	7-Apr-14

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
		COPPER, TOTAL						
	203	RECOVERABLE	NULL	NULL	14	NULL	14	7-Jun-10
			NULL	NULL	17	NULL	17	8-Jul-10
			NULL	NULL	14	NULL	14	6-Aug-10
			NULL	NULL	17	NULL	17	8-Sep-10
			NULL	NULL	16	NULL	16	7-Oct-10
			NULL	NULL	24	NULL	24	4-Nov-10
			NULL	NULL	26	NULL	26	7-Dec-10
			NULL	NULL	63.5	NULL	63.5	6-Jan-11
			NULL	NULL	27	NULL	27	3-Feb-11
			NULL	NULL	32	NULL	32	7-Mar-11
			NULL	NULL	24	NULL	24	5-Apr-11
			NULL	NULL	23	NULL	23	6-May-11
			NULL	NULL	17	NULL	17	7-Jun-11
			NULL	NULL	21	NULL	21	7-Jul-11
			NULL	NULL	13	NULL	13	4-Aug-11
			NULL	NULL	19	NULL	19	8-Sep-11
			NULL	NULL	22	NULL	22	4-Oct-11
			NULL	NULL	27	NULL	27	3-Nov-11
			NULL	NULL	21	NULL	21	8-Dec-11
			NULL	NULL	32	NULL	32	5-Jan-12
			NULL	NULL	28	NULL	28	2-Feb-12
			NULL	NULL	34	NULL	34	7-Mar-12
			NULL	NULL	25	NULL	25	5-Apr-12
			NULL	NULL	15	NULL	15	4-May-12
			NULL	NULL	16	NULL	16	6-Jun-12
			NULL	NULL	14	NULL	14	6-Jul-12
			NULL	NULL	7	NULL	7	7-Aug-12
			NULL	NULL	12	NULL	12	7-Sep-12
			NULL	NULL	13	NULL	13	9-Oct-12
			NULL	NULL	18	NULL	18	8-Nov-12
			NULL	NULL	17	NULL	17	6-Dec-12
			NULL	NULL	24	NULL	24	8-Jan-13
			NULL	NULL	24	NULL	24	7-Feb-13
			NULL	NULL	NULL	NULL	NULL	7-Mar-13
			NULL	NULL	18	NULL	18	4-Apr-13

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			NULL	NULL	9	NULL	9	3-May-13
			NULL	NULL	10	NULL	10	7-Jun-13
			NULL	NULL	13	NULL	13	8-Jul-13
			NULL	NULL	8	NULL	8	5-Aug-13
			NULL	NULL	13	NULL	13	6-Sep-13
			NULL	NULL	14	NULL	14	9-Oct-13
			NULL	NULL	15	NULL	15	5-Nov-13
			NULL	NULL	14	NULL	14	6-Dec-13
			NULL	NULL	21	NULL	21	8-Jan-14
			NULL	NULL	24	NULL	24	7-Feb-14
			NULL	NULL	25	NULL	25	5-Mar-14
			NULL	NULL	16	NULL	16	7-Apr-14
		CL2, INST TECH						
	213	MIN LIMIT	NULL	NULL	NULL	0.8	NULL	7-Jun-10
			NULL	NULL	NULL	0.60	NULL	8-Jul-10
			NULL	NULL	NULL	0.60	NULL	6-Aug-10
			NULL	NULL	NULL	0.7	NULL	8-Sep-10
			NULL	NULL	NULL	0.9	NULL	7-Oct-10
			NULL	NULL	NULL	1.6	NULL	4-Nov-10
			NULL	NULL	NULL	1.0	NULL	7-Dec-10
			NULL	NULL	NULL	0.8	NULL	6-Jan-11
			NULL	NULL	NULL	0.6	NULL	3-Feb-11
			NULL	NULL	NULL	2.0	NULL	7-Mar-11
			NULL	NULL	NULL	0.6	NULL	5-Apr-11
			NULL	NULL	NULL	0.7	NULL	6-May-11
			NULL	NULL	NULL	0.6	NULL	7-Jun-11
			NULL	NULL	NULL	0.6	NULL	7-Jul-11
			NULL	NULL	NULL	0.7	NULL	4-Aug-11
			NULL	NULL	NULL	1.2	NULL	8-Sep-11
			NULL	NULL	NULL	0.6	NULL	4-Oct-11
			NULL	NULL	NULL	1.1	NULL	3-Nov-11
			NULL	NULL	NULL	1.2	NULL	8-Dec-11
			NULL	NULL	NULL	0.7	NULL	5-Jan-12
			NULL	NULL	NULL	0.8	NULL	2-Feb-12
			NULL	NULL	NULL	1.6	NULL	7-Mar-12

Outfall Number	Code	Parameter	Quant Avg	Quanti Max	Conc Avg	Conc Min	Conc Max	Received Date
			NULL	NULL	NULL	1.5	NULL	5-Apr-12
			NULL	NULL	NULL	0.6	NULL	4-May-12
			NULL	NULL	NULL	1.1	NULL	6-Jun-12
			NULL	NULL	NULL	0.6	NULL	6-Jul-12
			NULL	NULL	NULL	1.0	NULL	7-Aug-12
			NULL	NULL	NULL	1.0	NULL	7-Sep-12
			NULL	NULL	NULL	0.6	NULL	9-Oct-12
			NULL	NULL	NULL	1.0	NULL	8-Nov-12
			NULL	NULL	NULL	1.0	NULL	6-Dec-12
			NULL	NULL	NULL	0.6	NULL	8-Jan-13
			NULL	NULL	NULL	1.6	NULL	7-Feb-13
			NULL	NULL	NULL	NULL	NULL	7-Mar-13
			NULL	NULL	NULL	0.70	NULL	4-Apr-13
			NULL	NULL	NULL	1.2	NULL	3-May-13
			NULL	NULL	NULL	0.6	NULL	7-Jun-13
			NULL	NULL	NULL	1.0	NULL	8-Jul-13
			NULL	NULL	NULL	0.60	NULL	5-Aug-13
			NULL	NULL	NULL	0.6	NULL	6-Sep-13
			NULL	NULL	NULL	1.0	NULL	9-Oct-13
			NULL	NULL	NULL	1.0	NULL	5-Nov-13
			NULL	NULL	NULL	0.6	NULL	6-Dec-13
			NULL	NULL	NULL	1.0	NULL	8-Jan-14
			NULL	NULL	NULL	1.6	NULL	7-Feb-14
			NULL	NULL	NULL	2.2	NULL	5-Mar-14
			NULL	NULL	NULL	1.0	NULL	7-Apr-14

ATTACHMENT F
MSTRANTI and STATS Outputs

MSTRANTI DATA SOURCE REPORT

Stream Information	
Salinity	3-CTR000.76 (Attachment C)
90% Temperature	3-CTR000.76 (Attachment C)
90% Maximum pH	3-CTR000.76 (Attachment C)
10% Maximum pH	3-CTR000.76 (Attachment C)
Tier Designation	Tier 2 (Attachment C)
Mixing Information	
32:1 ratio calculated by Dale Phillips as documented in his memo dated May 11, 1994 for the multiport diffuser. The 32:1 ratio reflects total (mixed) parts (i.e., 31 parts stream + 1 part effluent = 32 parts total, respectively). See Attachment G	
Effluent Information	
Mean Hardness	Not applicable for Tidal, Salt Water Discharges
90% Temperature	Application data; max. temperature reported was used*
90% Maximum pH	Effluent Data (DMRs, Attachment E)
10% Maximum pH	Effluent Data (DMRs, Attachment E)
Discharge Flow	Design Flow as reported in application

*The maximum temperature is always equal to or greater than a calculated 90th%; therefore, employing the maximum reported temperature in the reasonable potential analyses provides a conservative approach.

SALTWATER AND TRANSITION ZONES WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: **Tides Inn South WWTP**
Receiving Stream: **Carter Creek**

Permit No.: **VA0029351**

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	NA	mg/l
90th % Temperature (Annual) =	28.1	(° C)
90th % Temperature (Winter) =		(° C)
90th % Maximum pH =	8.1	
10th % Maximum pH =	7.5	
Tier Designation (1 or 2) =	2	
Early Life Stages Present Y/N =	Y	
Tidal Zone =	1	(1 = saltwater, 2 = transition zone)
Mean Salinity =	16	(g/kg)

Mixing Information

Design Flow (MGD)	0.0495
Acute WLA multiplier	32
Chronic WLA multiplier	32
Human health WLA multiplier	32

Effluent Information

Mean Hardness (as CaCO3) =	NA	mg/L
90 % Temperature (Annual) =	24	(° C)
90 % Temperature (Winter) =	4	(° C)
90 % Maximum pH =	8.84	SU
10 % Maximum pH =	8.57	SU
Discharge Flow =	0.0495	MGD

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Acenaphthene	0	--	--	9.9E+02	--	--	3.2E+04	--	--	9.9E+01	--	--	3.2E+03	--	--	3.2E+03
Acrolein	0	--	--	9.3E+00	--	--	3.0E+02	--	--	9.3E-01	--	--	3.0E+01	--	--	3.0E+01
Acrylonitrile ^C	0	--	--	2.5E+00	--	--	8.0E+01	--	--	2.5E-01	--	--	8.0E+00	--	--	8.0E+00
Aldrin ^C	0	1.3E+00	--	5.0E-04	4.2E+01	--	1.6E-02	3.3E-01	--	5.0E-05	1.0E+01	--	1.6E-03	1.0E+01	--	1.6E-03
Ammonia-N (mg/l) - Annual	0	2.50E+00	3.75E-01	--	7.99E+01	1.20E+01	--	6.25E-01	9.38E-02	--	2.00E+01	3.00E+00	--	2.00E+01	3.00E+00	--
Ammonia-N (mg/l) - Winter	0	1.86E+01	2.80E+00	--	5.95E+02	8.95E+01	--	4.65E+00	6.99E-01	--	1.49E+02	2.24E+01	--	1.49E+02	2.24E+01	--
Anthracene	0	--	--	4.0E+04	--	--	1.3E+06	--	--	4.0E+03	--	--	1.3E+05	--	--	1.3E+05
Antimony	0	--	--	6.4E+02	--	--	2.0E+04	--	--	6.4E+01	--	--	2.0E+03	--	--	2.0E+03
Arsenic	0	6.9E+01	3.6E+01	--	2.2E+03	1.2E+03	--	1.7E+01	9.0E+00	--	5.5E+02	2.9E+02	--	5.5E+02	2.9E+02	--
Benzene ^C	0	--	--	5.1E+02	--	--	1.6E+04	--	--	5.1E+01	--	--	1.6E+03	--	--	1.6E+03
Benzidine ^C	0	--	--	2.0E-03	--	--	6.4E-02	--	--	2.0E-04	--	--	6.4E-03	--	--	6.4E-03
Benzo (a) anthracene ^C	0	--	--	1.8E-01	--	--	5.8E+00	--	--	1.8E-02	--	--	5.8E-01	--	--	5.8E-01
Benzo (b) fluoranthene ^C	0	--	--	1.8E-01	--	--	5.8E+00	--	--	1.8E-02	--	--	5.8E-01	--	--	5.8E-01
Benzo (k) fluoranthene ^C	0	--	--	1.8E-01	--	--	5.8E+00	--	--	1.8E-02	--	--	5.8E-01	--	--	5.8E-01
Benzo (a) pyrene ^C	0	--	--	1.8E-01	--	--	5.8E+00	--	--	1.8E-02	--	--	5.8E-01	--	--	5.8E-01
Bis(2-Chloroethyl) Ether ^C	0	--	--	5.3E+00	--	--	1.7E+02	--	--	5.3E-01	--	--	1.7E+01	--	--	1.7E+01
Bis(2-Chloroisopropyl) Ether	0	--	--	6.5E+04	--	--	2.1E+06	--	--	6.5E+03	--	--	2.1E+05	--	--	2.1E+05
Bis(2-Ethylhexyl) Phthalate ^C	0	--	--	2.2E+01	--	--	7.0E+02	--	--	2.2E+00	--	--	7.0E+01	--	--	7.0E+01
Bromoform ^C	0	--	--	1.4E+03	--	--	4.5E+04	--	--	1.4E+02	--	--	4.5E+03	--	--	4.5E+03
Butylbenzylphthalate	0	--	--	1.9E+03	--	--	6.1E+04	--	--	1.9E+02	--	--	6.1E+03	--	--	6.1E+03
Cadmium	0	4.0E+01	8.8E+00	--	1.3E+03	2.8E+02	--	1.0E+01	2.2E+00	--	3.2E+02	7.0E+01	--	3.2E+02	7.0E+01	--
Carbon Tetrachloride ^C	0	--	--	1.6E+01	--	--	5.1E+02	--	--	1.6E+00	--	--	5.1E+01	--	--	5.1E+01
Chlordane ^C	0	9.0E-02	4.0E-03	8.1E-03	2.9E+00	1.3E-01	2.6E-01	2.3E-02	1.0E-03	8.1E-04	7.2E-01	3.2E-02	2.6E-02	7.2E-01	3.2E-02	2.6E-02

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
TRC	0			--			--	--	--	--	--	--	--	--	--	--
Chlorine Prod. Oxidant	0	1.3E+01	7.5E+00	--	4.2E+02	2.4E+02	--	3.3E+00	1.9E+00	--	1.0E+02	6.0E+01	--	1.0E+02	6.0E+01	--
Chlorobenzene	0	--	--	1.6E+03	--	--	5.1E+04	--	--	1.6E+02	--	--	5.1E+03	--	--	5.1E+03
Chlorodibromomethane ^C	0	--	--	1.3E+02	--	--	4.2E+03	--	--	1.3E+01	--	--	4.2E+02	--	--	4.2E+02
Chloroform	0	--	--	1.1E+04	--	--	3.5E+05	--	--	1.1E+03	--	--	3.5E+04	--	--	3.5E+04
2-Chloronaphthalene	0	--	--	1.6E+03	--	--	5.1E+04	--	--	1.6E+02	--	--	5.1E+03	--	--	5.1E+03
2-Chlorophenol	0	--	--	1.5E+02	--	--	4.8E+03	--	--	1.5E+01	--	--	4.8E+02	--	--	4.8E+02
Chlorpyrifos	0	1.1E-02	5.6E-03	--	3.5E-01	1.8E-01	--	2.8E-03	1.4E-03	--	8.8E-02	4.5E-02	--	8.8E-02	4.5E-02	--
Chromium III	0			--			--	--	--	--	--	--	--	--	--	--
Chromium VI	0	1.1E+03	5.0E+01	--	3.5E+04	1.6E+03	--	2.8E+02	1.3E+01	--	8.8E+03	4.0E+02	--	8.8E+03	4.0E+02	--
Chrysene ^C	0	--	--	1.8E-02	--	--	5.8E-01	--	--	1.8E-03	--	--	5.8E-02	--	--	5.8E-02
Copper	0	9.3E+00	6.0E+00	--	3.0E+02	1.9E+02	--	2.3E+00	1.5E+00	--	7.4E+01	4.8E+01	--	7.4E+01	4.8E+01	--
Cyanide, Free	0	1.0E+00	1.0E+00	1.6E+04	3.2E+01	3.2E+01	5.1E+05	2.5E-01	2.5E-01	1.6E+03	8.0E+00	8.0E+00	5.1E+04	8.0E+00	8.0E+00	5.1E+04
DDD ^C	0	--	--	3.1E-03	--	--	9.9E-02	--	--	3.1E-04	--	--	9.9E-03	--	--	9.9E-03
DDE ^C	0	--	--	2.2E-03	--	--	7.0E-02	--	--	2.2E-04	--	--	7.0E-03	--	--	7.0E-03
DDT ^C	0	1.3E-01	1.0E-03	2.2E-03	4.2E+00	3.2E-02	7.0E-02	3.3E-02	2.5E-04	2.2E-04	1.0E+00	8.0E-03	7.0E-03	1.0E+00	8.0E-03	7.0E-03
Demeton	0	--	1.0E-01	--	--	3.2E+00	--	--	2.5E-02	--	--	8.0E-01	--	--	8.0E-01	--
Diazinon	0	8.2E-01	8.2E-01	--	2.6E+01	2.6E+01	--	2.1E-01	2.1E-01	--	6.6E+00	6.6E+00	--	6.6E+00	6.6E+00	--
Dibenz(a,h)anthracene ^C	0	--	--	1.8E-01	--	--	5.8E+00	--	--	1.8E-02	--	--	5.8E-01	--	--	5.8E-01
1,2-Dichlorobenzene	0	--	--	1.3E+03	--	--	4.2E+04	--	--	1.3E+02	--	--	4.2E+03	--	--	4.2E+03
1,3-Dichlorobenzene	0	--	--	9.6E+02	--	--	3.1E+04	--	--	9.6E+01	--	--	3.1E+03	--	--	3.1E+03
1,4-Dichlorobenzene	0	--	--	1.9E+02	--	--	6.1E+03	--	--	1.9E+01	--	--	6.1E+02	--	--	6.1E+02
3,3-Dichlorobenzidine ^C	0	--	--	2.8E-01	--	--	9.0E+00	--	--	2.8E-02	--	--	9.0E-01	--	--	9.0E-01
Dichlorobromomethane ^C	0	--	--	1.7E+02	--	--	5.4E+03	--	--	1.7E+01	--	--	5.4E+02	--	--	5.4E+02
1,2-Dichloroethane ^C	0	--	--	3.7E+02	--	--	1.2E+04	--	--	3.7E+01	--	--	1.2E+03	--	--	1.2E+03
1,1-Dichloroethylene	0	--	--	7.1E+03	--	--	2.3E+05	--	--	7.1E+02	--	--	2.3E+04	--	--	2.3E+04
1,2-trans-dichloroethylene	0	--	--	1.0E+04	--	--	3.2E+05	--	--	1.0E+03	--	--	3.2E+04	--	--	3.2E+04
2,4-Dichlorophenol	0	--	--	2.9E+02	--	--	9.3E+03	--	--	2.9E+01	--	--	9.3E+02	--	--	9.3E+02
1,2-Dichloropropane ^C	0	--	--	1.5E+02	--	--	4.8E+03	--	--	1.5E+01	--	--	4.8E+02	--	--	4.8E+02
1,3-Dichloropropene ^C	0	--	--	2.1E+02	--	--	6.7E+03	--	--	2.1E+01	--	--	6.7E+02	--	--	6.7E+02
Dieldrin ^C	0	7.1E-01	1.9E-03	5.4E-04	2.3E+01	6.1E-02	1.7E-02	1.8E-01	4.8E-04	5.4E-05	5.7E+00	1.5E-02	1.7E-03	5.7E+00	1.5E-02	1.7E-03
Diethyl Phthalate	0	--	--	4.4E+04	--	--	1.4E+06	--	--	4.4E+03	--	--	1.4E+05	--	--	1.4E+05
2,4-Dimethylphenol	0	--	--	8.5E+02	--	--	2.7E+04	--	--	8.5E+01	--	--	2.7E+03	--	--	2.7E+03
Dimethyl Phthalate	0	--	--	1.1E+06	--	--	3.5E+07	--	--	1.1E+05	--	--	3.5E+06	--	--	3.5E+06
Di-n-Butyl Phthalate	0	--	--	4.5E+03	--	--	1.4E+05	--	--	4.5E+02	--	--	1.4E+04	--	--	1.4E+04
2,4 Dinitrophenol	0	--	--	5.3E+03	--	--	1.7E+05	--	--	5.3E+02	--	--	1.7E+04	--	--	1.7E+04
2-Methyl-4,6-Dinitrophenol	0	--	--	2.8E+02	--	--	9.0E+03	--	--	2.8E+01	--	--	9.0E+02	--	--	9.0E+02
2,4-Dinitrotoluene ^C	0	--	--	3.4E+01	--	--	1.1E+03	--	--	3.4E+00	--	--	1.1E+02	--	--	1.1E+02
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.1E-08	--	--	1.6E-06	--	--	5.1E-09	--	--	1.6E-07	--	--	1.6E-07
1,2-Diphenylhydrazine ^C	0	--	--	2.0E+00	--	--	6.4E+01	--	--	2.0E-01	--	--	6.4E+00	--	--	6.4E+00
Alpha-Endosulfan	0	3.4E-02	8.7E-03	8.9E+01	1.1E+00	2.8E-01	2.8E+03	8.5E-03	2.2E-03	8.9E+00	2.7E-01	7.0E-02	2.8E+02	2.7E-01	7.0E-02	2.8E+02

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Beta-Endosulfan	0	3.4E-02	8.7E-03	8.9E+01	1.1E+00	2.8E-01	2.8E+03	8.5E-03	2.2E-03	8.9E+00	2.7E-01	7.0E-02	2.8E+02	2.7E-01	7.0E-02	2.8E+02
Alpha + Beta Endosulfan	0	3.4E-02	8.7E-03	--	1.1E+00	2.8E-01	--	8.5E-03	2.2E-03	--	2.7E-01	7.0E-02	--	2.7E-01	7.0E-02	--
Endosulfan Sulfate	0	--	--	8.9E+01	--	--	2.8E+03	--	--	8.9E+00	--	--	2.8E+02	--	--	2.8E+02
Endrin	0	3.7E-02	2.3E-03	6.0E-02	1.2E+00	7.4E-02	1.9E+00	9.3E-03	5.8E-04	6.0E-03	3.0E-01	1.8E-02	1.9E-01	3.0E-01	1.8E-02	1.9E-01
Endrin Aldehyde	0	--	--	3.0E-01	--	--	9.6E+00	--	--	3.0E-02	--	--	9.6E-01	--	--	9.6E-01
Ethylbenzene	0	--	--	2.1E+03	--	--	6.7E+04	--	--	2.1E+02	--	--	6.7E+03	--	--	6.7E+03
Fluoranthene	0	--	--	1.4E+02	--	--	4.5E+03	--	--	1.4E+01	--	--	4.5E+02	--	--	4.5E+02
Fluorene	0	--	--	5.3E+03	--	--	1.7E+05	--	--	5.3E+02	--	--	1.7E+04	--	--	1.7E+04
Guthion	0	--	1.0E-02	--	--	3.2E-01	--	--	2.5E-03	--	--	8.0E-02	--	--	8.0E-02	--
Heptachlor ^C	0	5.3E-02	3.6E-03	7.9E-04	1.7E+00	1.2E-01	2.5E-02	1.3E-02	9.0E-04	7.9E-05	4.2E-01	2.9E-02	2.5E-03	4.2E-01	2.9E-02	2.5E-03
Heptachlor Epoxide ^C	0	5.3E-02	3.6E-03	3.9E-04	1.7E+00	1.2E-01	1.2E-02	1.3E-02	9.0E-04	3.9E-05	4.2E-01	2.9E-02	1.2E-03	4.2E-01	2.9E-02	1.2E-03
Hexachlorobenzene ^C	0	--	--	2.9E-03	--	--	9.3E-02	--	--	2.9E-04	--	--	9.3E-03	--	--	9.3E-03
Hexachlorobutadiene ^C	0	--	--	1.8E+02	--	--	5.8E+03	--	--	1.8E+01	--	--	5.8E+02	--	--	5.8E+02
Hexachlorocyclohexane Alpha-BHC ^C	0	--	--	4.9E-02	--	--	1.6E+00	--	--	4.9E-03	--	--	1.6E-01	--	--	1.6E-01
Hexachlorocyclohexane Beta-BHC ^C	0	--	--	1.7E-01	--	--	5.4E+00	--	--	1.7E-02	--	--	5.4E-01	--	--	5.4E-01
Hexachlorocyclohexane Gamma-BHC ^C (Lindane)	0	1.6E-01	--	1.8E+00	5.1E+00	--	5.8E+01	4.0E-02	--	1.8E-01	1.3E+00	--	5.8E+00	1.3E+00	--	5.8E+00
Hexachlorocyclopentadiene	0	--	--	1.1E+03	--	--	3.5E+04	--	--	1.1E+02	--	--	3.5E+03	--	--	3.5E+03
Hexachloroethane ^C	0	--	--	3.3E+01	--	--	1.1E+03	--	--	3.3E+00	--	--	1.1E+02	--	--	1.1E+02
Hydrogen Sulfide	0	--	2.0E+00	--	--	6.4E+01	--	--	5.0E-01	--	--	1.6E+01	--	--	1.6E+01	--
Indeno (1,2,3-cd) pyrene C	0	--	--	1.8E-01	--	--	5.8E+00	--	--	1.8E-02	--	--	5.8E-01	--	--	5.8E-01
Isophorone ^C	0	--	--	9.6E+03	--	--	3.1E+05	--	--	9.6E+02	--	--	3.1E+04	--	--	3.1E+04
Kepone	0	--	0.0E+00	--	--	0.0E+00	--	--	0.0E+00	--	--	0.0E+00	--	--	0.0E+00	--
Lead	0	2.4E+02	9.3E+00	--	7.7E+03	3.0E+02	--	6.0E+01	2.3E+00	--	1.9E+03	7.4E+01	--	1.9E+03	7.4E+01	--
Malathion	0	--	1.0E-01	--	--	3.2E+00	--	--	2.5E-02	--	--	8.0E-01	--	--	8.0E-01	--
Mercury	0	1.8E+00	9.4E-01	--	5.8E+01	3.0E+01	--	4.5E-01	2.4E-01	--	1.4E+01	7.5E+00	--	1.4E+01	7.5E+00	--
Methyl Bromide	0	--	--	1.5E+03	--	--	4.8E+04	--	--	1.5E+02	--	--	4.8E+03	--	--	4.8E+03
Methylene Chloride ^C	0	--	--	5.9E+03	--	--	1.9E+05	--	--	5.9E+02	--	--	1.9E+04	--	--	1.9E+04
Methoxychlor	0	--	3.0E-02	--	--	9.6E-01	--	--	7.5E-03	--	--	2.4E-01	--	--	2.4E-01	--
Mirex	0	--	0.0E+00	--	--	0.0E+00	--	--	0.0E+00	--	--	0.0E+00	--	--	0.0E+00	--
Nickel	0	7.4E+01	8.2E+00	4.6E+03	2.4E+03	2.6E+02	1.5E+05	1.9E+01	2.1E+00	4.6E+02	5.9E+02	6.6E+01	1.5E+04	5.9E+02	6.6E+01	1.5E+04
Nitrobenzene	0	--	--	6.9E+02	--	--	2.2E+04	--	--	6.9E+01	--	--	2.2E+03	--	--	2.2E+03
N-Nitrosodimethylamine ^C	0	--	--	3.0E+01	--	--	9.6E+02	--	--	3.0E+00	--	--	9.6E+01	--	--	9.6E+01
N-Nitrosodiphenylamine ^C	0	--	--	6.0E+01	--	--	1.9E+03	--	--	6.0E+00	--	--	1.9E+02	--	--	1.9E+02
N-Nitrosodi-n-propylamine ^C	0	--	--	5.1E+00	--	--	1.6E+02	--	--	5.1E-01	--	--	1.6E+01	--	--	1.6E+01
Nonylphenol	0	7.0E+00	1.7E+00	--	2.2E+02	5.4E+01	--	1.8E+00	4.3E-01	--	5.6E+01	1.4E+01	--	5.6E+01	1.4E+01	--
Parathion	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB Total ^C	0	--	3.0E-02	6.4E-04	--	9.6E-01	2.0E-02	--	7.5E-03	6.4E-05	--	2.4E-01	2.0E-03	--	2.4E-01	2.0E-03
Pentachlorophenol ^C	0	1.3E+01	7.9E+00	3.0E+01	4.2E+02	2.5E+02	9.6E+02	3.3E+00	2.0E+00	3.0E+00	1.0E+02	6.3E+01	9.6E+01	1.0E+02	6.3E+01	9.6E+01

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Phenol	0	--	--	8.6E+05	--	--	2.8E+07	--	--	8.6E+04	--	--	2.8E+06	--	--	2.8E+06
Phosphorus (Elemental)	0	--	1.0E-01	--	--	3.2E+00	--	--	2.5E-02	--	--	8.0E-01	--	--	8.0E-01	--
Pyrene	0	--	--	4.0E+03	--	--	1.3E+05	--	--	4.0E+02	--	--	1.3E+04	--	--	1.3E+04
Selenium	0	2.9E+02	7.1E+01	4.2E+03	9.3E+03	2.3E+03	1.3E+05	7.3E+01	1.8E+01	4.2E+02	2.3E+03	5.7E+02	1.3E+04	2.3E+03	5.7E+02	1.3E+04
Silver	0	1.9E+00	--	--	6.1E+01	--	--	4.8E-01	--	--	1.5E+01	--	--	1.5E+01	--	--
1,1,2,2-Tetrachloroethane ^C	0	--	--	4.0E+01	--	--	1.3E+03	--	--	4.0E+00	--	--	1.3E+02	--	--	1.3E+02
Tetrachloroethylene ^C	0	--	--	3.3E+01	--	--	1.1E+03	--	--	3.3E+00	--	--	1.1E+02	--	--	1.1E+02
Thallium	0	--	--	4.7E-01	--	--	1.5E+01	--	--	4.7E-02	--	--	1.5E+00	--	--	1.5E+00
Toluene	0	--	--	6.0E+03	--	--	1.9E+05	--	--	6.0E+02	--	--	1.9E+04	--	--	1.9E+04
Toxaphene ^C	0	2.1E-01	2.0E-04	2.8E-03	6.7E+00	6.4E-03	9.0E-02	5.3E-02	5.0E-05	2.8E-04	1.7E+00	1.6E-03	9.0E-03	1.7E+00	1.6E-03	9.0E-03
Tributyltin	0	4.2E-01	7.4E-03	--	1.3E+01	2.4E-01	--	1.1E-01	1.9E-03	--	3.4E+00	5.9E-02	--	3.4E+00	5.9E-02	--
1,2,4-Trichlorobenzene	0	--	--	7.0E+01	--	--	2.2E+03	--	--	7.0E+00	--	--	2.2E+02	--	--	2.2E+02
1,1,2-Trichloroethane ^C	0	--	--	1.6E+02	--	--	5.1E+03	--	--	1.6E+01	--	--	5.1E+02	--	--	5.1E+02
Trichloroethylene ^C	0	--	--	3.0E+02	--	--	9.6E+03	--	--	3.0E+01	--	--	9.6E+02	--	--	9.6E+02
2,4,6-Trichlorophenol ^C	0	--	--	2.4E+01	--	--	7.7E+02	--	--	2.4E+00	--	--	7.7E+01	--	--	7.7E+01
Vinyl Chloride ^C	0	--	--	2.4E+01	--	--	7.7E+02	--	--	2.4E+00	--	--	7.7E+01	--	--	7.7E+01
Zinc	0	9.0E+01	8.1E+01	2.6E+04	2.9E+03	2.6E+03	8.3E+05	2.3E+01	2.0E+01	2.6E+03	7.2E+02	6.5E+02	8.3E+04	7.2E+02	6.5E+02	8.3E+04

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- For transition zone waters, spreadsheet prints the lesser of the freshwater and saltwater water quality criteria.
- Regular WLA = (WQC x WLA multiplier) - (WLA multiplier - 1)(background conc.)
- Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
= (0.1(WQC - background conc.) + background conc.) for human health
- Antideg. WLA = (Antideg. Baseline)(WLA multiplier) - (WLA multiplier - 1)(background conc.)

Metal	Site Specific Target Value (SSTV)
Antimony	2.0E+03
Arsenic III	1.7E+02
Cadmium	4.2E+01
Chromium III	#VALUE!
Chromium VI	2.4E+02
Copper	2.9E+01
Lead	4.5E+01
Mercury	4.5E+00
Nickel	3.9E+01
Selenium	3.4E+02
Silver	6.1E+00
Zinc	2.9E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

STATS.exe Outputs

AMMONIA

Facility = Tides Utilities South WWTP
Chemical = Ammonia (mg/L)
Chronic averaging period = 30
WLAa = 20
WLAc = 3
Q.L. = 0.1
samples/mo. = 4
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average = 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 6.05301028024893
Average Weekly Limit = 6.05301028024893
Average Monthly Limit = 4.13859882328494

The data are:

9 mg/L

Note: 9.00 mg/L was used as this is an empirical concentration expected in domestic discharges per Guidance Memorandum 00-2011. As indicated, water quality-based effluent limitations are necessary. Limitations are the same as the limitations the 2010 permit.

CHLORINE

Facility = Tides Utilities South WWTP
Chemical = CPO (ug/L)
Chronic averaging period = 4
WLAa = 100
WLAc = 60
Q.L. = 100
samples/mo. = 90
samples/wk. = 23

Summary of Statistics:

observations = 1
Expected Value = 20000
Variance = 1440000
C.V. = 0.6
97th percentile daily values = 48668.3
97th percentile 4 day average = 33275.8
97th percentile 30 day average = 24121.0
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 87.7544870431939
Average Weekly Limit = 45.236175318072
Average Monthly Limit = 40.352380356661

The data are:

20000 ug/L

Note: 20000 ug/L was used to force a limitation per Guidance Memorandum 00-2011. As indicated, Water quality based limitations are necessary. Limitations are the same as the 2010 permit.

ATTACHMENT G

Diffuser Calculations and Stream Model

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

Water Division

4900 Cox Road Glen Allen, Virginia 23060

MEMORANDUM

Subject: Tides Inn Diffuser Calculations

To: Denice Mosca, KRO

From: M. Dale Phillips, OWRM

Dale

Date: May 11, 1994

Copies: File

I have made the CORMIX runs you requested. The multiport runs should be considered approximate because the model cannot faithfully model the proposed port configuration. However, the results should be sufficiently reliable to base ammonia limits on.

The dilution available for the single port diffuser is about 16:1.

The dilution available for the multiport diffuser is at least double that. Since the results are approximate, I would suggest that you use 32:1.

RECEIVED
MAY 12 1994

NTOX = 0
 NSTD = 0
 REGMZ = 0
 XINT = 5000.00 XMAX = 5000.00

X-Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and the diffuser mid-point:
 9.00 m from the LEFT bank/shore.

X-axis points downstream, Y-axis points to left, Z-axis points upward.

NSTEP = 25 display intervals per module

BEGIN MOD201: DIFFUSER DISCHARGE MODULE

Profile definitions:

BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
 BH = top-hat half-width, in horizontal plane normal to trajectory
 S = hydrodynamic centerline dilution
 C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.05	1.0	.100E+04	.00	1.00

END OF MOD201: DIFFUSER DISCHARGE MODULE

BEGIN MOD221: WEAKLY DEFLECTED PLUME IN CROSSFLOW

Profile definitions:

BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
 BH = top-hat half-width, in horizontal plane normal to trajectory
 S = hydrodynamic centerline dilution
 C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.05	1.0	.100E+04	.00	1.00
.00	.00	.09	2.7	.365E+03	.01	1.01
.00	.00	.14	4.5	.223E+03	.02	1.01
.00	.00	.18	6.2	.161E+03	.02	1.02
.00	.00	.22	8.0	.126E+03	.03	1.03
.00	.00	.27	9.7	.103E+03	.04	1.03
.00	.00	.31	11.5	.873E+02	.04	1.04
.00	.00	.35	13.2	.758E+02	.05	1.05
.00	.00	.40	14.9	.670E+02	.06	1.05
.00	.00	.44	16.7	.600E+02	.06	1.06
.00	.00	.49	18.4	.543E+02	.07	1.07
.00	.00	.53	20.2	.496E+02	.08	1.07
.00	.00	.57	21.9	.457E+02	.08	1.08
.00	.00	.62	23.6	.423E+02	.09	1.08
.00	.00	.66	25.4	.394E+02	.10	1.09
.00	.00	.70	27.1	.369E+02	.10	1.10
.00	.00	.75	28.9	.346E+02	.11	1.10
.00	.00	.79	30.6	.327E+02	.11	1.11
.00	.00	.83	32.4	.309E+02	.12	1.12
.00	.00	.88	34.1	.293E+02	.13	1.12
.00	.00	.92	35.8	.279E+02	.13	1.13
.00	.00	.96	37.6	.266E+02	.14	1.14
.00	.00	1.01	39.3	.254E+02	.15	1.14
.00	.00	1.05	41.1	.244E+02	.15	1.15
.00	.00	1.09	42.8	.234E+02	.16	1.16

BEGIN MOD101: DISCHARGE MODULE (FLOW ESTABLISHMENT)

X	Y	Z	S	C	B
.00	.00	.05	1.0	.100E+04	.08

END OF MOD101: DISCHARGE MODULE (FLOW ESTABLISHMENT)

BEGIN MOD111: WEAKLY DEFLECTED JET IN CROSSFLOW

CROSSFLOWING DISCHARGE

This flow region is INSIGNIFICANT in spatial extent and will be by-passed.

END OF MOD111: WEAKLY DEFLECTED JET IN CROSSFLOW

BEGIN MOD121: WEAKLY DEFLECTED PLUME IN CROSSFLOW

Profile definitions:

B = Gaussian 1/e (37%) half-width, normal to trajectory

S = hydrodynamic centerline dilution

C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	B
.00	.00	.05	1.0	.100E+04	.03
.00	-277.04	.10	1.3	.771E+03	.04
.00	-351.90	.14	1.6	.615E+03	.04
.00	-405.86	.19	2.0	.504E+03	.05
.00	-449.83	.24	2.4	.423E+03	.05
.00	-487.72	.28	2.8	.360E+03	.06
.00	-521.44	.33	3.2	.311E+03	.06
.00	-552.09	.37	3.7	.272E+03	.07
.00	-580.36	.42	4.2	.240E+03	.07
.01	-606.71	.47	4.7	.214E+03	.08
.01	-631.47	.51	5.2	.192E+03	.08
.01	-654.91	.56	5.8	.173E+03	.09
.01	-677.19	.61	6.3	.158E+03	.09
.01	-698.48	.65	6.9	.144E+03	.10
.01	-718.90	.70	7.6	.132E+03	.10
.01	-738.53	.75	8.2	.122E+03	.11
.01	-757.46	.79	8.9	.113E+03	.11
.01	-775.76	.84	9.6	.105E+03	.12
.01	-793.49	.89	10.3	.973E+02	.12
.01	-810.69	.93	11.0	.909E+02	.13
.01	-827.41	.98	11.7	.851E+02	.13
.01	-843.68	1.02	12.5	.799E+02	.14
.02	-859.54	1.07	13.3	.752E+02	.14
.02	-875.01	1.12	14.1	.709E+02	.15
.02	-890.13	1.16	14.9	.670E+02	.15
.02	-904.91	1.21	15.8	.635E+02	.16

Cumulative travel time = 1. sec

END OF MOD121: WEAKLY DEFLECTED PLUME IN CROSSFLOW

BEGIN MOD132: LAYER BOUNDARY IMPINGEMENT/UPSTREAM SPREADING

Vertical angle of layer/boundary impingement = .18 deg
Horizontal angle of layer/boundary impingement = 270.00 deg

Carter's Creek			
	.000	2.060	2.060
DATA			
WIDTH	6		
1	.000	3494.000	
2	.340	1165.000	
3	.530	1941.000	
4	.660	1165.000	
5	1.180	776.500	
6	2.000	388.200	
DISP	2		
1	2.060	.000	
2	.000	701.959	
VELO	2		
1	2.060	.000	
2	.000	.108	
TEMP	2		
1	.190	27.000	
2	1.060	29.000	
REDI	1		
1	1.030	1.500	
DECAY	1		
1	1.030	.150	
DECAY	1		
1	1.030	.075	
3	6		
1	.000	5.000	
2	.340	5.000	
3	.530	4.000	
4	.660	3.000	
5	1.180	3.000	
6	2.000	2.000	
-SATDO			
-REAER			
TOP			
LOW			
	.340	.006	
	.660	.009	
	.960	.009	
	1.180	.077	
	2.000	.050	
TOP			
BOD			
	.340	.006	.415
	.660	.009	.375
	.960	.009	.355
	1.180	.077	60.000
	2.000	.050	90.000
TOP			
BOD			
	.340	.006	7.500
	.660	.009	7.500
	.960	.009	7.500
	1.180	.077	125.000
TOP			
BOD			
	.190	.000	5.200
	1.060	.077	5.790
XED	.190		
TOP			
IT			

hide NBOD.dat
 to check sensitivity
 of model to NBOD
 at Tides Inn -

To modify model
 dataset, program asks
 NBOD instead of TRN
 which is requested when
 data is first input.
 Assumption is made that
 1mg N ≈ 5mg O₂ and
 TRN values are multiplied
 by 5 for input as NBOD

difference between
 DO concentrations for
 tide model out and
 tide NBOD.out is a 0.
 mg/L DO decrease at
 junctions 5 + 6 -

Model run December 1991
 Denise M. Mosca

25 mg/L TRN -

5.200

**** REGIONAL MODELING SYSTEM ****

**** FEATURING ****

**** AUTO \$\$ WATER QUALITY MODEL ****

**** STEADY STATE WATER QUALITY MODEL ****
 **** RUN TITLECarter's Creek ****

**** BASIC NETWORK DATA ****
 **** RIVER MILE OF DOWNSTREAM END... .00
 **** RIVER MILE OF UPSTREAM END..... 2.06
 **** RIVER MILE OF FALL LINE..... 2.06
 **** NUMBER OF SECTIONS..... 5

 ***** ESTUARY / STREAM INPUT DATA *****

**** CHANNEL WIDTHS (FT) ****

CHAN NO	RIVER MILE	VALUE	CHAN NO	RIVER MILE	VALUE
1	.21	.208E+04	4	1.44	652.
2	.62	.142E+04	5	1.85	457.
3	1.03	889.			

**** JUNCTION SURFACE AREAS (SQFT) ****

JUNC NO	RIVER MILE	VALUE	JUNC NO	RIVER MILE	VALUE
1	.00	.453E+07	4	1.24	.168E+07
2	.41	.381E+07	5	1.65	.121E+07
3	.82	.251E+07	6	2.06	.995E+06

**** DISPERSTION COEFFICIENTS (SQFT/SEC) ****

CHAN NO	RIVER MILE	VALUE	CHAN NO	RIVER MILE	VALUE
1	.21	632.	4	1.44	111.

1.00 331.

*** AVERAGE CHANNEL TIDAL VELOCITIES (FT/SEC) ****

CHAN NO	RIVER MILE	VALUE	CHAN NO	RIVER MILE	VALUE
1	.21	.972E-01	4	1.44	.324E-01
2	.62	.756E-01	5	1.85	.108E-01
3	1.03	.540E-01			

*** JUNCTION WATER TEMPERATURES (DEG-C) **** *

JUNC NO	RIVER MILE	VALUE	JUNC NO	RIVER MILE	VALUE
1	.00	27.0	4	1.24	29.0
2	.41	27.5	5	1.65	29.0
3	.82	28.5	6	2.06	29.0

*** OXYGEN UPTAKE OF SEDIMENTS (GM O2/SQM/DAY) *****

JUNC NO	RIVER MILE	VALUE	JUNC NO	RIVER MILE	VALUE
1	.00	1.50	4	1.24	1.50
2	.41	1.50	5	1.65	1.50
3	.82	1.50	6	2.06	1.50

*** CBOD DECAY RATES CORRECTED TO STREAM TEMP - (1/DAY) *****

JUNC NO	RIVER MILE	VALUE	JUNC NO	RIVER MILE	VALUE
1	.00	.207	4	1.24	.227
2	.41	.212	5	1.65	.227
3	.82	.221	6	2.06	.227

*** NBOD DECAY RATES CORRECTED TO STREAM TEMP - (1/DAY) *****

JUNC NO	RIVER MILE	VALUE	JUNC NO	RIVER MILE	VALUE
1	.00	.129	4	1.24	.150
2	.41	.134	5	1.65	.150
3	.82	.144	6	2.06	.150

*** A3 COEFFICIENT FOR FLOW EQUATION *****
 ** REPRESENTS DEPTH OF FLOW IF A1 AND/OR A2 ARE ZERO ***

CHAN NO	RIVER MILE	VALUE	CHAN NO	RIVER MILE	VALUE
1	.21	3.00	4	1.44	2.08
2	.62	3.32	5	1.85	2.18
3	1.03	3.00			

*** COMPUTED OXYGEN SATURATION CONCENTRATIONS (PPM) *****

*** TOTAL INFLOWS = .2
 *** TOTAL DIVERSIONS .0
 *** OUTFLOW AT DOWNSTREAM JUNCTION =

*** INFLOWS (CFS) *****

JUNC NO	RIVER MILE	VALUE	JUNC NO	RIVER MILE	VALUE
1	.00	.000	4	1.24	.770E-01
2	.41	.600E-02	5	1.65	.000
3	.82	.180E-01	6	2.06	.500E-01

*** DIVERSIONS (CFS) *****

JUNC NO	RIVER MILE	VALUE	JUNC NO	RIVER MILE	VALUE
1	.00	.151	4	1.24	.000
2	.41	.000	5	1.65	.000
3	.82	.000	6	2.06	.000

*** CHANNEL FLOWS (CFS) *****

CHAN NO	RIVER MILE	VALUE	CHAN NO	RIVER MILE	VALUE
1	.21	-.151	4	1.44	-.500E-01
2	.62	-.145	5	1.85	-.500E-01
3	1.03	-.127			

 STEADY STATE CBOD INPUT CONCENTRATIONS (PPM)

JUNC NO	RIVER MILE	VALUE	JUNC NO	RIVER MILE	VALUE
1	.00	.000	4	1.24	60.0
2	.41	.415	5	1.65	.000
3	.82	.365	6	2.06	90.0

CONVERGENCE IN 21 CYCLES

Inter's Creek

*** STEADY STATE CBOD CONCENTRATION *****

*** OUTFLOW AT DOWNSTREAM END= .15 *****

CONCENTRATIONS (PPM)

1	.00	61	4	1.24	9.73
2	.41	9.63	5	1.65	9.73
3	.82	9.69	6	2.06	9.73

 DEPTH OR VELOCITY DEPENDENT VARIABLES

 CROSS-SECTIONAL AREAS OF CHANNELS (SQFT) *****

CHAN NO	RIVER MILE	VALUE	CHAN NO	RIVER MILE	VALUE
1	.21	.104E+05	4	1.44	.175E+04
2	.62	.470E+04	5	1.85	996.
3	1.03	.267E+04			

 CHANNEL DEPTHS (FT) *****

CHAN NO	RIVER MILE	VALUE	CHAN NO	RIVER MILE	VALUE
1	.21	5.00	4	1.44	2.68
2	.62	3.32	5	1.85	2.18
3	1.03	3.00			

 CHANNEL VELOCITIES (FT/SEC) *****

CHAN NO	RIVER MILE	VALUE	CHAN NO	RIVER MILE	VALUE
1	.21	.972E-01	4	1.44	.324E-01
2	.62	.756E-01	5	1.85	.108E-01
3	1.03	.540E-01			

 JUNCTION VOLUMES (CUFT) *****

JUNC NO	RIVER MILE	VALUE	JUNC NO	RIVER MILE	VALUE
1	.00	.227E+08	4	1.24	.480E+07
2	.41	.164E+08	5	1.65	.299E+07
3	.82	.802E+07	6	2.06	.217E+07

 COMPUTED REAERATION RATES (1/DAY) *****

JUNC NO	RIVER MILE	VALUE	JUNC NO	RIVER MILE	VALUE
1	.00	.425	4	1.24	.685
2	.41	.365	5	1.65	.700
3	.82	.710	6	2.06	.510

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ESTUARY SITE EVALUATION and DATA PREPARATION FORM

Name of Stream Carter's creek Topographic map Swington

Date of inspection _____ Inspector J. Mosca

Name of Discharge Tides Ina STP River mile (1.18) 8cm of 14cm Lind. Church

Proposed limits: BOD5 24 TKN 3.6 D.O. 0.7 FLOW 4950 cfs
 $2.4 \times 1.5 = 3.6$ $1 \text{ mi} = 6.8 \text{ cm}$ $14 \text{ cm} \times \frac{1 \text{ mi}}{6.8 \text{ cm}} = 2.06$
 $4950 \text{ cfs} \times 1.547 \text{ mgd} = 7659 \text{ cfs}$ $\frac{5 \text{ mi}}{14 \text{ cm}} = 0.36$

Are there major Tributaries in the section you want to model? NO

If yes, enter data for the mouth of the stream:

BOD5	TKN	D.O.	Flow	R.M.
_____	_____	_____	_____	_____
BOD5	TKN	D.O.	Flow	R.M.
_____	_____	_____	_____	_____
BOD5	TKN	D.O.	Flow	R.M.
_____	_____	_____	_____	_____
BOD5	TKN	D.O.	Flow	R.M.
_____	_____	_____	_____	_____

Are there marshes bordering the stream you want to model? NO

If yes enter the % of the length that is bordered by marsh _____

Is excessive algae a problem in this stream? NO

River mile of fall line 2.06 River mile of model beginning 2.06

River mile of model end 0.0 Number of segments you want in model 5

Estimate the following at model beginning (background conditions):

7Q10 0 BOD5 _____ TKN _____ D.O. _____

Complete the following for as many points as you have data for:

R.M.	Width	Depth	Temperature
0.0	0.16 mi	5 ft	27
0.34	1.5 cm	5 ft	27
0.60	2.6 mi	4 ft	27
1.18	0.1 mi	3 ft	29
2.06	0.2 cm	2 ft	29
_____	_____	_____	_____
_____	_____	_____	_____

90% tile $2.5 \text{ cm width} \times \frac{1 \text{ mi}}{6.8 \text{ cm}} = 0.36$

Discharge

2 pts BOD -
 RM 0.19 B.
 (90% percent value)
 RM 1.18 24
 (discharge)

1 ft TKN 3.6 mg/L
 2 ft DO - 90% percent 0.19
 12 cm Rapp length
 $\times 25 \text{ mi} = 63.8 \text{ mile length}$
 4.7 cm
 Carter Creek 10.7 cm
 $63.8 - 56.9 = 6.89 \text{ mi}$

Type of stream being modeled: (see page 64 of manual) _____

Confluence	river mile	stream type	length
A	_____	1	_____
B	<u>6.89 mi</u>	2	_____
C	_____	3	_____
D	_____	<u>4</u>	_____
E	_____	5	_____
		6	_____

Carter's Creek Model with other discharges

scale	Rm	width	depth	temp
at 0.0		0.66 mi x 5280 ft = <u>3497</u>	5 ft	70% % 2
3 cm x $\frac{1 \text{ mi}}{6.8}$ = 0.34		1.5 cm / 6.8 = 0.22 mi x $\frac{5280 \text{ ft}}{\text{mi}}$ = <u>1165</u>	5	27
2 cm x $\frac{1 \text{ mi}}{6.8}$ = 0.53		2.5 cm / 6.8 = 0.37 x 5280 = <u>1941</u>	4	27
5 cm x $\frac{1 \text{ mi}}{6.8}$ = 0.66		1.5 cm <u>1165</u>	3	29
18 RM Discharge		1.0 cm = 776.5	3	29
2.0		0.5 cm 388.2 ft	2 ft	29

BOD points

BOD	Location	Q cfs	Rm
166	Oyster world	$1.547 \text{ MGD} \times 1.547 = .00619$	0.34
150	WF Morgan	$.00619$	0.66
	Stingray Pt	$.00309$	
		<u>.00928</u>	
142	Banack + Reynolds	.006 .00928	0.94
24	Tides Inn	.07659 cfs	1.18
136	Tides Lodge	.0325 MGD x 1.547 = .0503 cfs	2.0

tide 5. dat

also modify Q's.

TKN pts Morgan + Yocomico NH₃ ~ 150 TKN: 1.5
insert for all oyster, use 3.6 for TL.

SELECT NPID FNML CNTY FLOW RWAT FROM ACTTAB ORDER BY NPID WHERE RWAT EQ +

"Carter's Creek"

NPID	FNML	CNTY	FLOW	RWAT			
26 ✓	VA0002828	Oyster World, Inc.	Lancaster	4000	.0046	Carter's Creek	RM 0.34
	VA0003182	Irvington Packing Co., Inc.	Lancaster		.007	Carter's Creek	
200 ✓	VA0003620	W. F. Morgan & Sons, Inc	Lancaster	4000	.0065	Carter's Creek	
JX ✓	VA0003735	Abbott Brothers, Inc.	Lancaster		.003	Carter's Creek	
S ✓	VA0003743	W. O. Ashburn, Jr. Seafood	Lancaster		.0155	Carter's Creek	0.34
42 ✓	VA0003786	Barrack & Reynolds Sfd, Inc.	Lancaster	6000	.026	Carter's Creek	
ST ✓	VA0004472	W. Ellery Keilum, Inc	Lancaster		.005	Carter's Creek	
MS ✓	VA0028908	J. Henry Talbott Seafood	Lancaster		.0005	Carter's Creek	
	VA0029343	The Tides Golf Lodge, Inc.	Lancaster		.0325	Carter's Creek	
	VA0029351	The Tides Inn, Inc.	Lancaster		.03	Carter's Creek	
47 ✓	VA0035692	Stingray Point Oyster Co., Inc.	Lancaster	2000	.005	Carter's Creek	

ATTACHMENT H

VDH and USFWS Coordination Responses



RECEIVED PRO

JAN 12 2015

COMMONWEALTH of VIRGINIA

Marissa J. Levine, MD, MPH, FAAFP
State Health Commissioner

DEPARTMENT OF HEALTH
OFFICE OF DRINKING WATER
East Central Field Office

300 Turner Road
Richmond, VA 23225
Phone: 804-674-2880
Fax: 804-674-2815

John J. Aulbach II, PE
Director, Office of Drinking Water

TO: Laura Galli, VPDES Permit Writer
Department of Environmental Quality, Piedmont Regional Office

FROM: Dan Horne, P.E., Field Director *MS for FD*
Office of Drinking Water, Southeast Virginia Field Office

DATE: January 8, 2015

SUBJECT: VPDES Permit Application No. VA0029351 Re-issuance (existing) Issuance (new)
VWP Permit Application No.

COUNTY/CITY: Lancaster County

OWNER/APPLICANT: Tides Utilities, LLC

LOCATION OF DISCHARGE / ACTIVITY Carter's Creek

COMMENTS:

There are no public water supply intakes within 15 miles downstream of the discharge / activity.

The raw water intake for the _____ waterworks is located ___ miles downstream from the discharge. We recommend a minimum Reliability Class ___ for this facility [, which is] [the same as the existing Reliability Class] [more stringent than the existing Reliability Class].

The raw water intake for the _____ waterworks is located ___ miles downstream from the discharge.

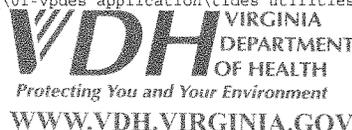
Please forward a copy of the Draft Permit for our review and comment.

Other comments:

Reviewer: Monte Waugh

c: VDH-Central Office, ODW

r:\pd17\05-project review\01-application- deq\01-vpdes application\tides utilities- south wtp reissuance 15y01m.docx



Archived: Wednesday, January 21, 2015 11:55:11 AM
From: Galli, Laura (DEQ)
Sent: Wednesday, January 21, 2015 11:52:00 AM
To: 'Hillman, Brett'
Subject: RE: VPDES Permit No. VA0029351 USFWS Coordination
Importance: Normal
Attachments: [Attachment H - VDH and USFWS Responses.pdf](#);

Hello Brett,

Thank you for your comments and concerns. Please note that there are no public water supplies within 15 miles downstream of the discharge (please see the attached VDH coordination response). Therefore, DEQ believes that a comparison with the PWS criterion for dichlorobromomethane is not required.

Regards,

Laura

Laura Galli

VPDES Permit Writer

Virginia Department of Environmental Quality

Piedmont Regional Office

4949-A Cox Rd

Glen Allen, Virginia 23060

Ph. (804) 527-5095

laura.galli@deq.virginia.gov

From: Hillman, Brett [mailto:brett_hillman@fws.gov]
Sent: Tuesday, January 20, 2015 1:58 PM
To: Galli, Laura (DEQ)
Subject: Re: VPDES Permit No. VA0029351 USFWS Coordination

Hi Laura,

Thanks again for sending along the materials necessary for us to review this permit issuance. We wanted to take a look at this one because the federally listed endangered Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) is known to occur in the vicinity of this facility's discharge to Carter's Creek.

Our only concern is with the concentration of Dichlorobromomethane that was reported on the application. At 22 ug/L, the concentration is 4 times higher than the public water supply criterion of 5.5 ug/L. Although there are no aquatic life criteria for this substance, we recommend investigating the need for a limitation based on the public water supply criterion. This will help ensure that the permit is protective of the sturgeon.

Thanks for considering this comment. Please let me know if you have any questions!

Best,

Brett

Brett Hillman

Fish and Wildlife Biologist

[U.S. Fish & Wildlife Service](#)

[Virginia Field Office](#)

6669 Short Lane

Gloucester, VA 23061

Phone: 804-824-2420

ATTACHMENT I

Owner Review Comments